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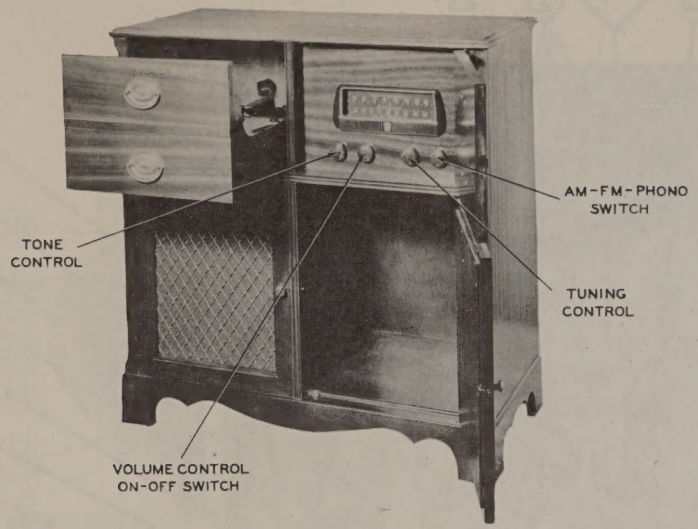
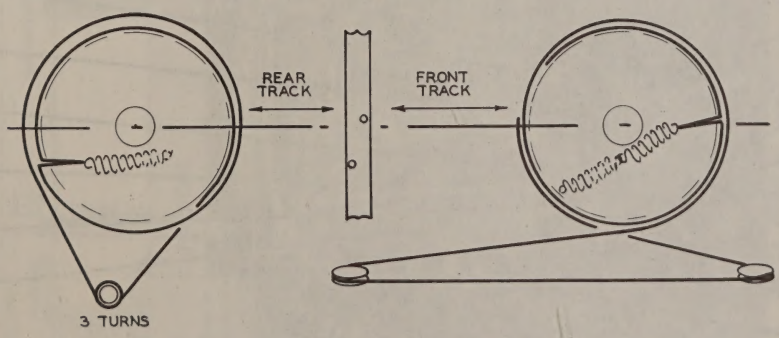


AIRLINE MODEL 94BR-2740A

TRADE NAME	Airline, Models 94BR-2740A, 94BR-2741A, 94BR-2741B		
SUPPLIER	Montgomery Ward and Co., 619 Chicago Ave., Chicago, Illinois		
TYPE SET	AC Operated Combination Phono-Radio, AM-FM Superheterodyne Receiver with Loop Antenna		
TUBES (SEVEN)	Types 12AT7 FM RF Amp.-Mixer, 12BA7 AM Converter, -FM Oscillator, 12BA6 1st IF Amp., 12AU6 FM 2nd IF Amp., 12AL5 Ratio Det., 12AV6 DET-AVC-AF, 50L6GT Power Output		
POWER SUPPLY	105-125 Volts AC	RATING	.46 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	535-1620KC	FREQ. MOD.	88-108MC



DIAL CORD DRIVE

AIRLINE MODELS
94BR-2740A, 94BR-2741A, B

AIRLINE MODELS
94BR-2740A, 94BR-2741A, B

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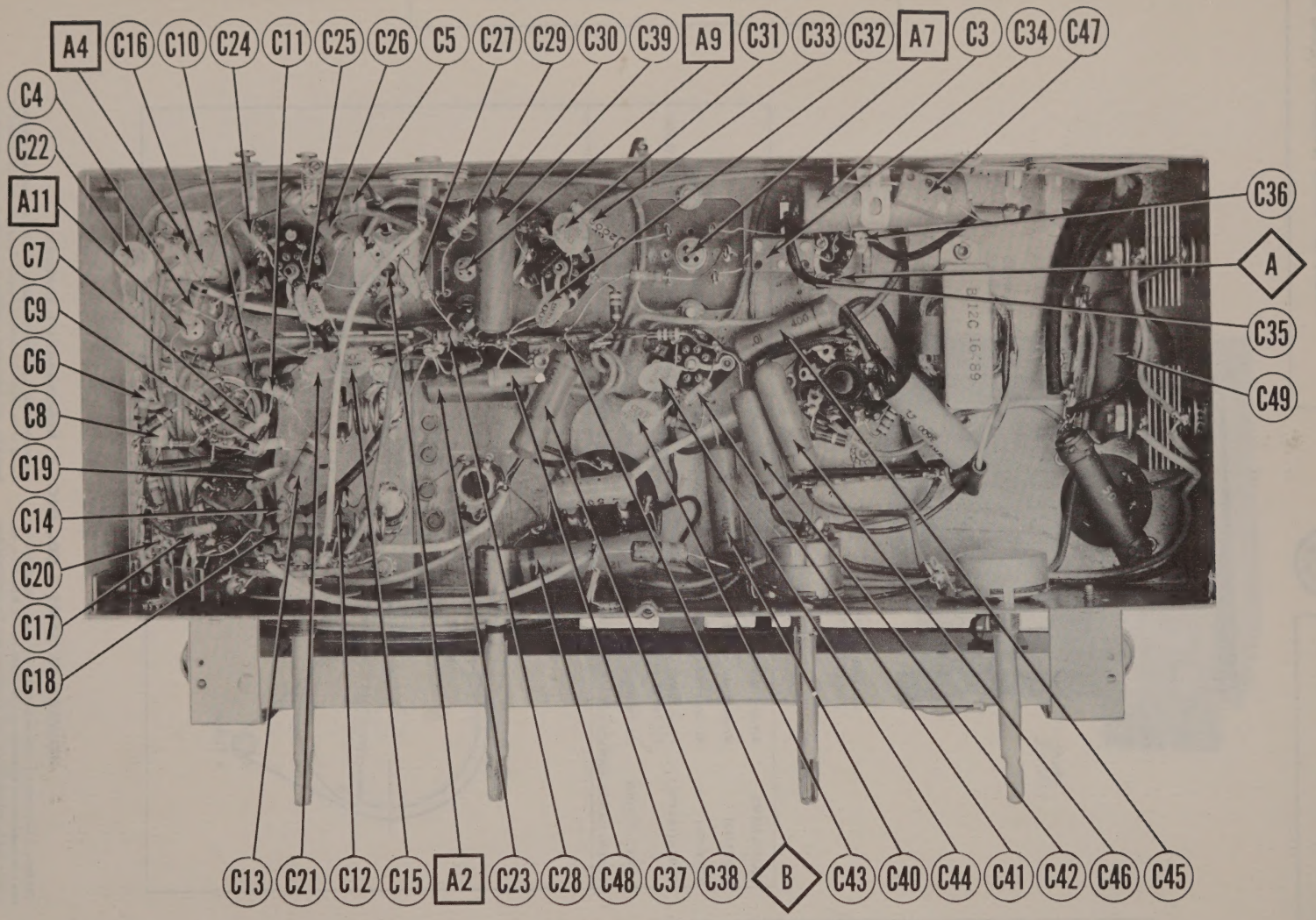
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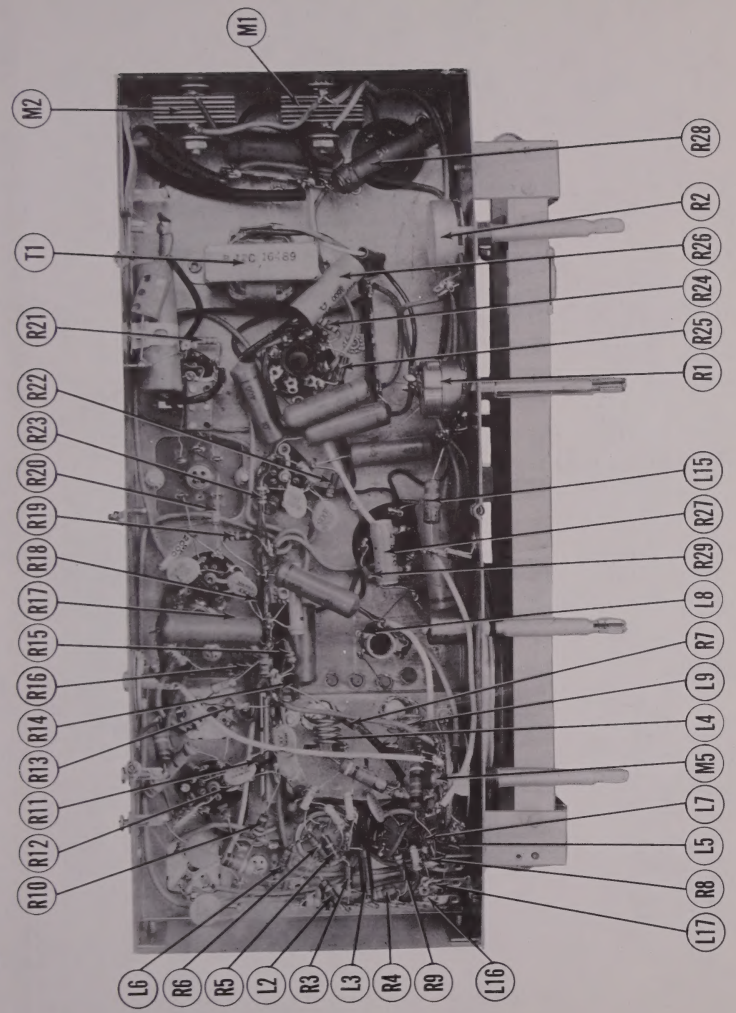

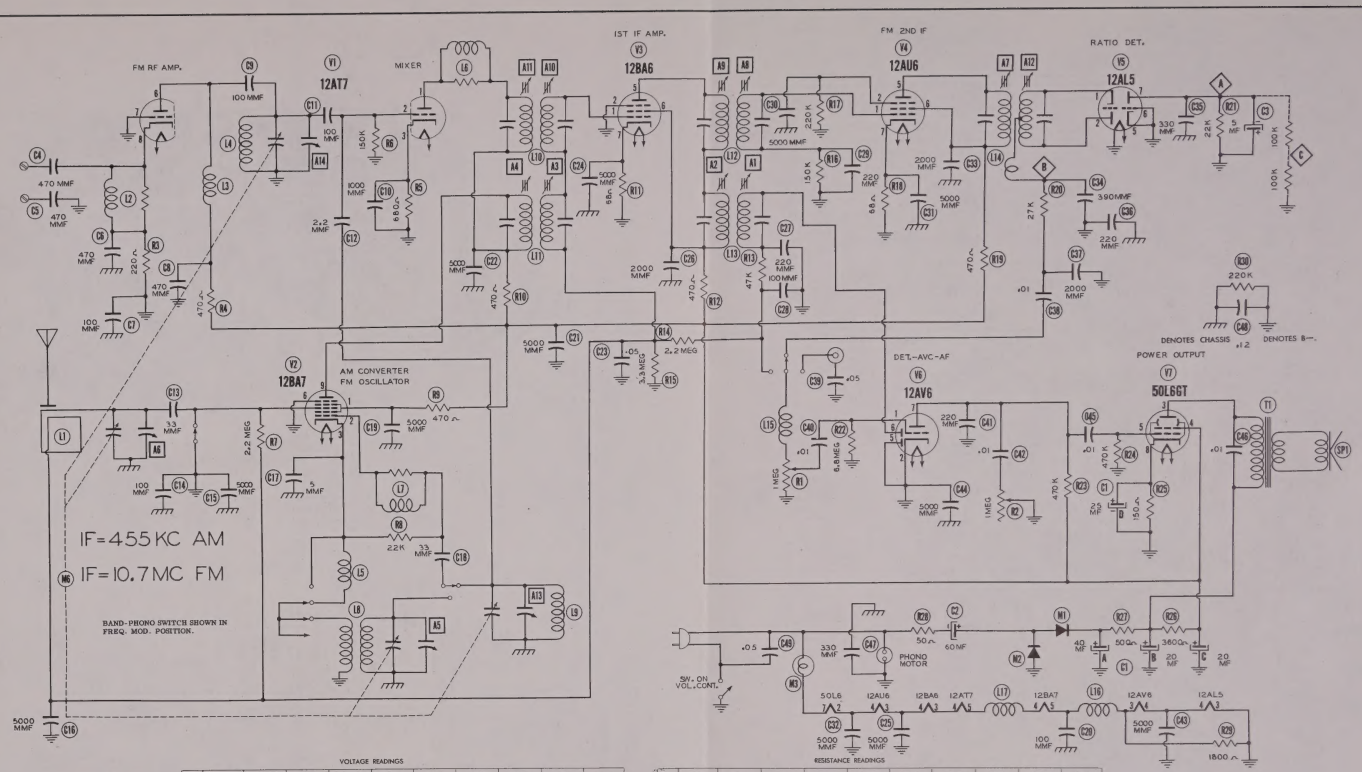

VOLTAGE READINGS

	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
†	V1	12AT7	87VDC	0V.	1.1VDC	48VAC	36VAC	87VDC	0V.	.7VDC	42VAC
	V2A	12BA7	80VDC	5-4.8VDC	0V.	36VAC	23VAC	0V.	-.7VDC	0V.	90VDC
†	V2B	12BA7	80VDC	5-1.1VDC	0V.	36VAC	23VAC	0V.	0V.	0V.	85VDC
	V3	12BA6	-.2VDC	0V.	48VAC	58VAC	90VDC	90VDC	.6VDC		
†	V4	12AU6	-.1VDC	-.1VDC	58VAC	70VAC	87VDC	87VDC	.4VDC		
†	V5	12AL5	-.4VDC	-.3VDC	0V.	12VAC	0V.	0V.	-.7VDC		
	V6	12AV6	-.6VDC	0V.	12VAC	23VAC	0V.	-.5VDC	55VDC		
	V7	50L6GT	0V.	70VAC	210VDC	90VDC	0V.	0V.	117VAC	6.1VDC	

5 TAKEN WITH VACUUM TUBE VOLTMETER.

† TAKEN IN FM POSITION.

RESISTANCE READINGS

	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
†	V1	12AT7	†4KΩ	150KΩ	680Ω	†0Ω	32Ω	†4KΩ	0Ω	220Ω	36Ω
	V2A	12BA7	†4KΩ	22KΩ	1Ω	32Ω	23Ω	0Ω	3.3 Meg.	0Ω	†4KΩ
†	V2B	12BA7	†4KΩ	22KΩ	1Ω	32Ω	23Ω	0Ω	0Ω	0Ω	†4KΩ
	V3	12BA6	2 Meg.	0Ω	40Ω	48Ω	†4KΩ	†4KΩ	8Ω		
†	V4	12AU7	150KΩ	220KΩ	48Ω	58Ω	†4KΩ	†4KΩ	8Ω		
†	V5	12AL5	Inf.	Inf.	0Ω	12Ω	0Ω	Inf.	22KΩ		
	V6	12AV6	6.8 Meg.	0Ω	23Ω	12Ω	0Ω	1 Meg.	†470KΩ		
	V7	50L6GT	Inf.	58Ω	†650Ω	13.8KΩ	470KΩ	0Ω	13Ω	150Ω	

† MEASURED FROM OUTPUT OF M1.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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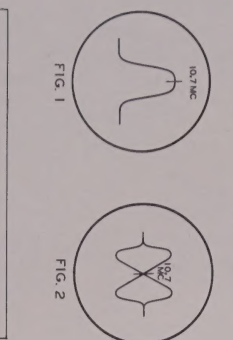

DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove phono motor power plug and pick-up plug.
3. Remove loop antenna lead plug.
4. Remove speaker lead plug.
5. Loosen two antenna terminal screws and remove **TM** antenna leads.
6. Remove three 1/4" hex head bolts holding chassis. Remove chassis.
7. Remove four phillips screws holding speaker. Remove speaker.
8. Remove two phillips screws holding loop antenna. Remove antenna.

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer (zero tuning cap fully closed) and set pointer (hairline) reference mark at low frequency end of dial. Use insulation screwdriver (1 provided). If not AM ALIGNMENT operator is cautioned to remove feed wire at signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Keep output reading low to avoid AVC action. Use lowest sensitivity that will give a satisfactory output reading. Use an insulated alignment screwdriver for adjusting.

Set RADIO-PHONO switch to RADIO. Connect signal generator output leads to receiver antenna terminals as indicated in the following table. Keep output of signal generator as low as possible for good signal-to-noise ratio. Use the lowest signal generator output that will give a satisfactory output reading. Keep the receiver volume control at maximum.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	REMARKS
1.	.05MFD	High side to pin 7 (Y2). Low side to B-.	455KC - Mod. (Unmod.)	A1, A2, A3, A4	Tuning gang fully open	Across voice coil	Adjust for maximum output. If output meter is used, reduce dummy antenna to .005MFD to reduce hum modulation.
2.	.05MFD	High side to "AM" side to B-. Low	1650KC	"	Extreme right hand mark.	"	Adjust for maximum output.
3.	.05MFD	"	1650KC	A6	"	"	Adjust for maximum output.

FM RF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM.

Connect two matched 1000Ω (±5%) resistors in series from point A to chassis. The junction of these two resistors is alignment point C as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	VTVM CONNECT	BAND SWITCH POS.	REMARKS
4.	.05MFD	High side to pin 7 (Y2). Low side to B-.	455KC - Mod. (Unmod.)	A1, A2, A3, A4	Tuning gang fully open	DC Probe to Point C. Common to B-.	A1, A2, A3, A4	Adjust for maximum deflection.
5.	.05MFD	"	1650KC (CW)	A5	Extreme right hand mark.	"	A5	Adjust for maximum deflection.
6.	.05MFD	"	1650KC	A6	"	"	A6	Adjust for maximum deflection.

FM RF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM.

Use 1000Ω (±5%) resistors in series from point A to chassis. The junction of these two resistors is alignment point C as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	VTVM CONNECT	BAND SWITCH POS.	REMARKS
4.	.05MFD	High side to point "FM" section on tuning gang. Low side to B-.	10.7MC (CW)	A1, A2, A3, A4	Tuning gang fully closed.	DC Probe to Point C. Common to B-.	A1, A2, A3, A4	Adjust for maximum deflection.
5.	"	"	10.7MC (CW)	A5	Set to interference	"	A5	Adjust for maximum deflection.
6.	"	"	10.7MC (CW)	A6	"	"	A6	Adjust for maximum deflection.

Use frequency modulated signal with 8% modulation and 400KC sweep. Use 125 - sawtooth voltage to scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
4.	High side to point "FM" section on tuning gang. Low side to B-.	10.7MC (Sweep)	A1, A2, A3, A4	Tuning gang fully closed.	Vert. Amp. to Point C. Low side to B-.	A12	Reconnect capacitor C5. Adjust for maximum amplitude and symmetry as per Fig 1.
5.	"	"	A5, A6	Set to interference	"	A5, A6	Disconnect stabilizer capacitor C5. Adjust for maximum amplitude and symmetry as per Fig 1.
6.	"	"	All	"	"	All	Adjust for zero reading. A good compromise will be obtained on either side of the correct setting.

Reconnect capacitor C5. Adjust A13 for maximum amplitude on Ch. Adjust for maximum amplitude and symmetry as per Fig 1.

Disconnect stabilizer capacitor C5. Adjust A5 and A6 SLIGHTLY towards A7 for maximum amplitude and symmetry as per Fig 2. Readjust A7 for maximum amplitude and symmetry as per Fig 2. Read

PHOTOFACT* Folder

AIRLINE MODEL
94BR-3017A

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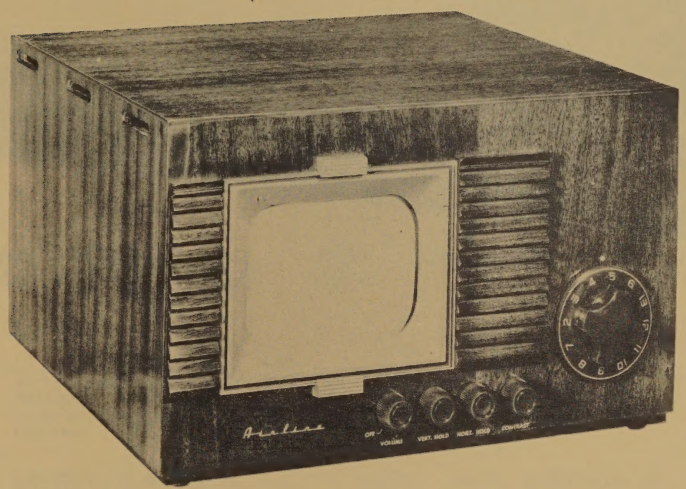

AIRLINE MODEL
94BR-3017A

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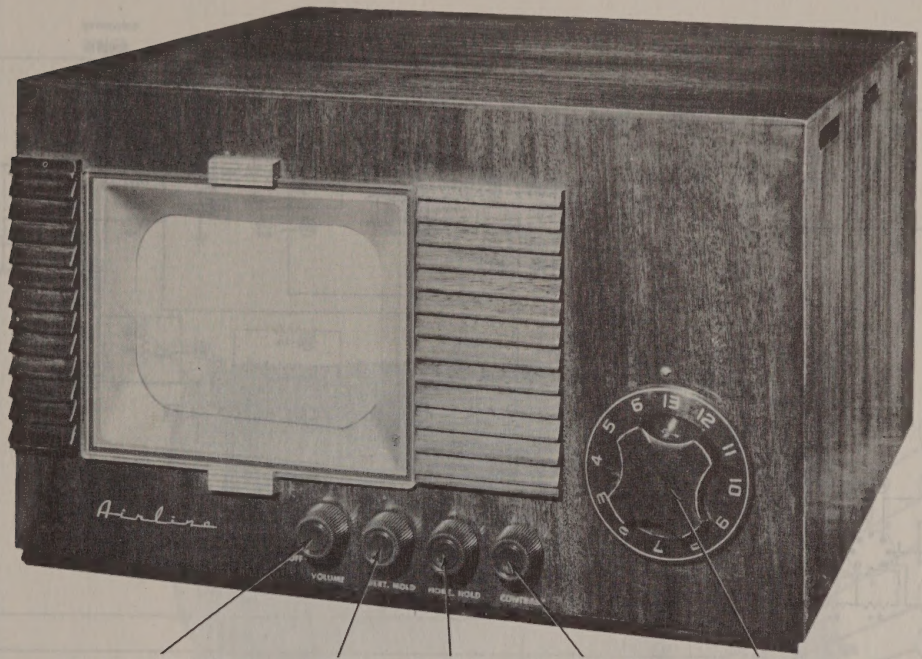

AIRLINE MODEL
94BR-3017A

TRADE NAME	Airline Model 94BR-3017A
SUPPLIER	Montgomery Ward and Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Eighteen

POWER SUPPLY 105-125 Volts AC or DC RATING: .97 Amp. @ 117 Volts AC
TUNING RANGE—Channels 2 thru 13

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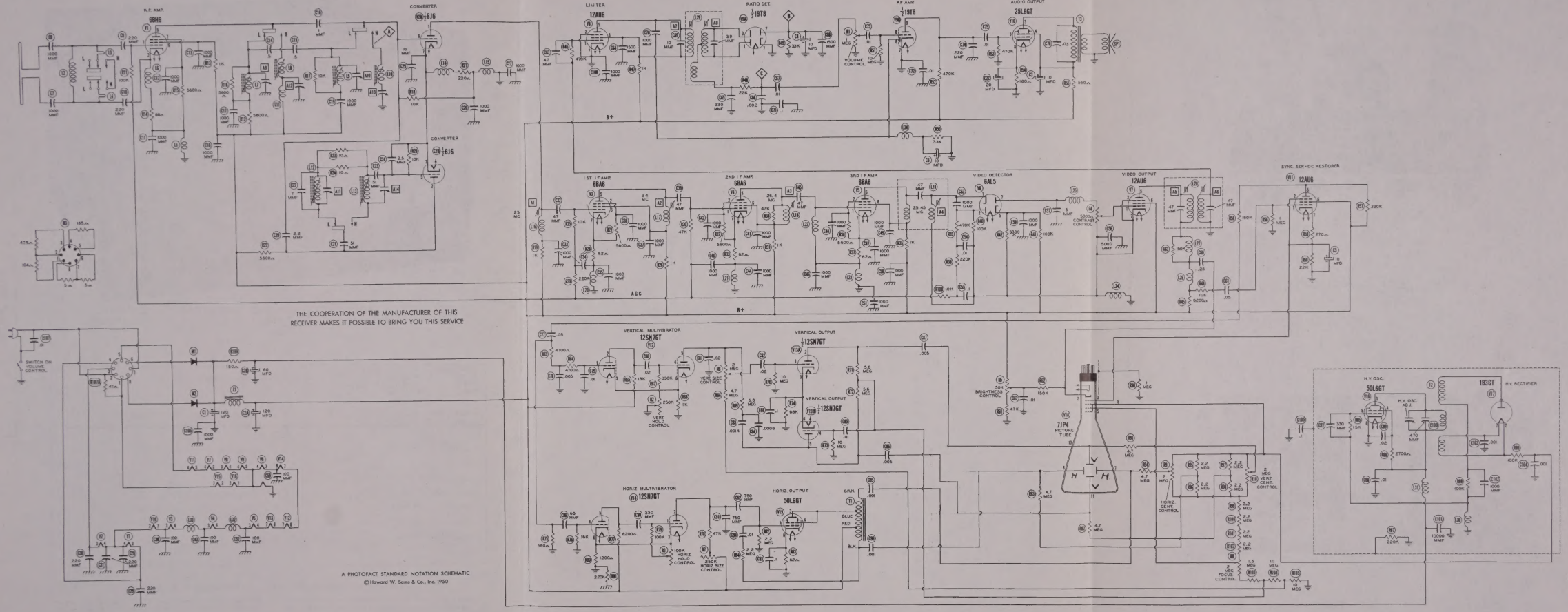
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CONVERTER
½6J6
CONVERTER
½6J6
LIMITER
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RATIO DET.
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H.V. OSC.
50L6GT
H.V. RECTIFIER
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7JP4
PICTURE TUBE
AGC
B+
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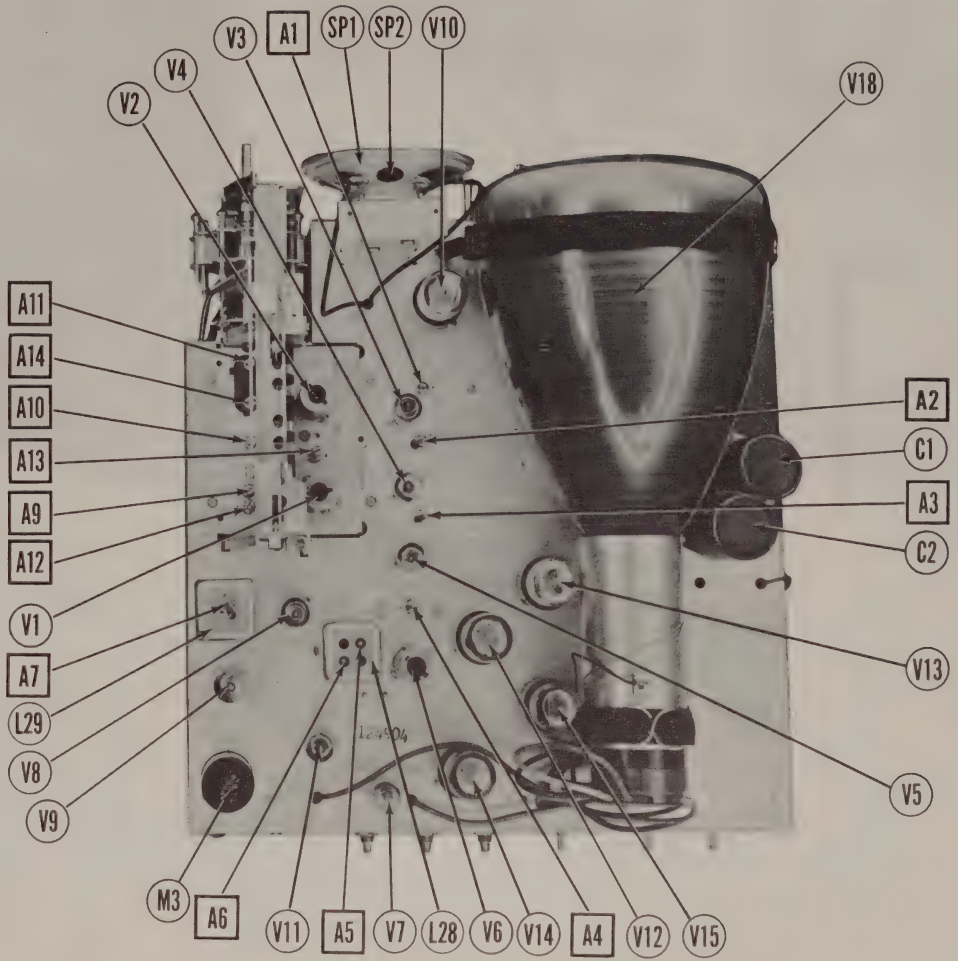
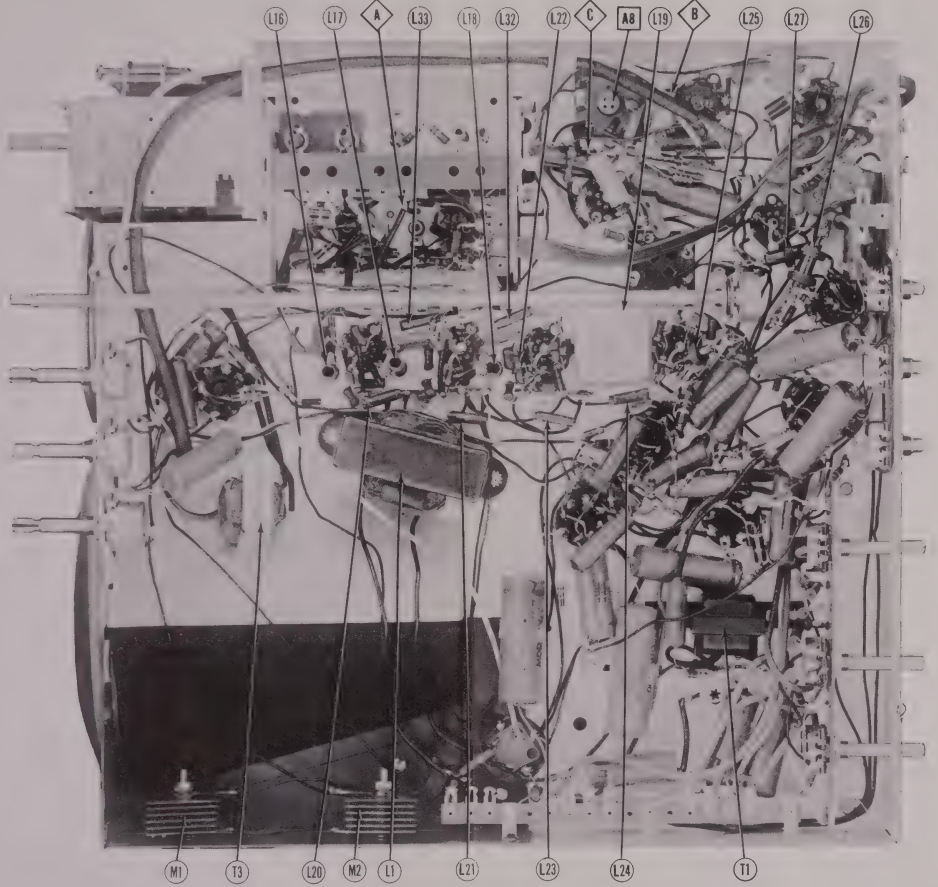
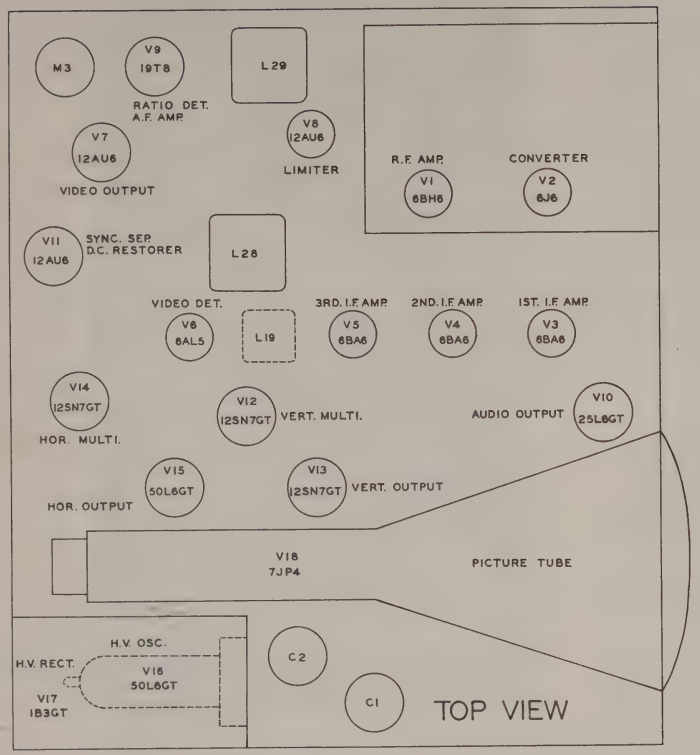
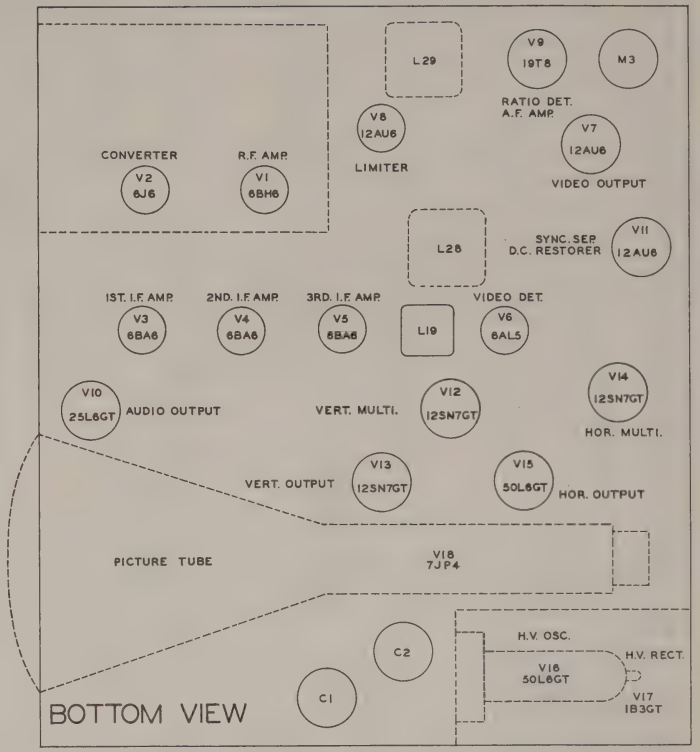


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

PRE- ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Alignment of this receiver may be performed without removal of the picture tube or disabling the high voltage supply. When the receiver is placed on its side, care must be exercised not to damage the picture tube or to come in contact with the high voltage leads.

VIDEO IF ALIGNMENT

Alignment point A, where the IF signal is injected is accessible thru the large hole in the tuner shield on the underside of the tuner.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	47MMF	High side thru 47MMF to Point A. Low side to chassis.	23.0MC	9	Across contrast control (R4)	A1	Adjust for maximum deflection.
2.	47MMF	"	24.0MC	"	"	A2	"
3.	47MMF	"	26.4MC	"	"	A3	"
4.	47MMF	"	25.45MC	"	"	A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	47MMF	High side to Point A. Low side to chassis.	24MC (10MC Sweep)	26.75MC 22.25MC	9	Across contrast control (R4) with 10KΩ in series with Vert. Amp. lead. Shunt vertical input terminals with .001MFD capacitor.		If necessary, slightly retouch A1, A2, A3, A4 for proper response curve and placement of markers as per Fig 1.

SOUND IF ALIGNMENT

Short the antenna leads during alignment of the ratio detector circuit so extraneous noise pulses will not give erratic indications on the oscilloscope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	Across contrast control (Control fully on)	4.5MC (1MC Sweep)	4.5MC	9	Vert. Amp. to Point (B) Low side to B-.	A5,A6	Disconnect stabilizer cap (C4). Adjust for maximum amplitude and symmetry as per Fig 2.
7.	.01MFD	"	"	"	"	Vert. Amp. to Point (◇) Low side to B-.	A7,A8	Reconnect stabilizer cap. Adjust A7 so 4.5MC marker is at center of pattern as per Fig 3. Adjust A8 for maximum amplitude and straightness of diagonal line.

TUNER ALIGNMENT

Pre-set the tuner cores and trimmers as indicated in figures 4 and 5 before attempting alignment of the tuner. If Fig.5, the dimensions given are the distance from the screw head shoulder to chassis. When making the adjustments of the station selector screws do not force the screw at any time. The "in" position is reached when the black shuttle bar holding the core slugs reaches the top limit of its travel. It is possible to force the screw in farther than this point but this results in jamming the tuner.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 125Ω carbon res.	Across antenna terminals with 125Ω resistor in each generator lead.	Approx. 85MC (10MC Sweep)	Off	6	Across contrast control (R4) with 10KΩ in Vert. Amp. lead. Shunt vert. input terminals with .001MMF capacitor.	A9,A10	Turn channel 6 station selector screw 1 full turn from its maximum "in" position. Adjust A9 and A10 for maximum amplitude and symmetry as per Fig 6.
9.	"	"	"	83.25MC	"	"	A11	Adjust A11 so marker is 50% down on the low frequency slope on curve. If necessary, repeat step 8.
10.	"	"	Approx. 79MC (10MC Sweep) Approx. 69MC (10MC Sweep) Approx. 63MC (10MC Sweep)	77.25MC 67.25MC 61.25MC	5 4 3	"		Check the response on all low band channels. It may be necessary to forfeit some of the response on one channel to improve that of another by slight retouching of A9 and A10.
11.	"	"	Approx. 57MC (10MC Sweep)	55.25MC	2	"		If it is possible to move video marker to 50% point on the curve by the station-selector screw (with screw at least 2 turns from its maximum "out" position) the low band is properly aligned.

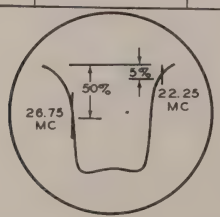


FIG. 1

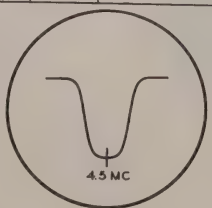


FIG. 2

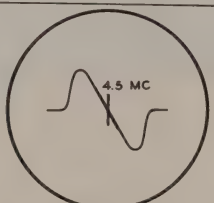
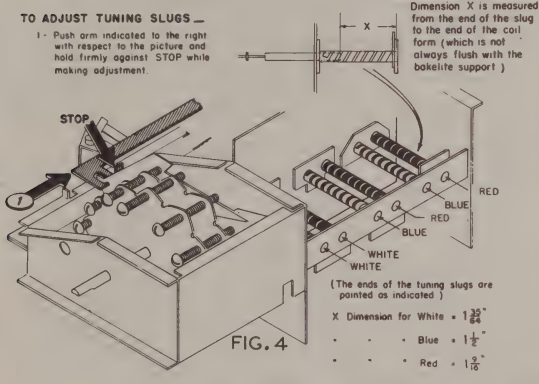


FIG. 3

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	"	"	Approx. 213MC (10MC Sweep)	Off	13	"	A12, A13	Turn channel 13 station selector screw 3/4 turn from it maximum "in" position. Adjust A12 and A13 for maximum amplitude and symmetry as per Fig 6.
13.	"	"	"	211.25MC	"	"	A14	Adjust A14 so marker is 50% down on the low frequency slope on curve. If necessary, repeat step 12.
14.	"	"	Approx. 207MC (10MC Sweep) Approx. 201MC (10MC Sweep) Approx. 195MC (10MC Sweep) Approx. 189MC (10MC Sweep) Approx. 183MC (10MC Sweep)	205.25MC 199.25MC 193.25MC 187.25MC 181.25MC	12 11 10 9 8	"		Check response on all high band channels. If necessary, retouch A12 and A13 for compromise to give best overall response curve.
15.	"	"	Approx. 177MC (10MC Sweep)	175.25MC	7	"		If it is possible to move video carrier marker to 50% point on response curve by adjustment of channel 7 station-selector screw (screw at least one full turn in from its maximum "out" position), the high band is properly aligned.


TO ADJUST TUNING SLUGS —
1 - Push arm indicated to the right with respect to the picture and hold firmly against STOP while making adjustment.
X
Dimension X is measured from the end of the slug to the end of the coil form (which is not always flush with the bakelite support)
STOP
RED
BLUE
RED
BLUE
WHITE
WHITE
(The ends of the tuning slugs are painted as indicated)
X Dimension for White = 1 35/64"
" " " Blue = 1 1/2"
" " " Red = 1 7/16"
FIG. 4

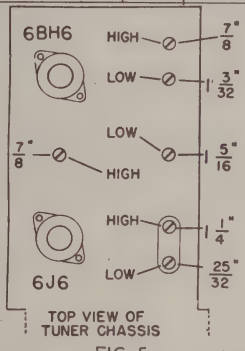


FIG. 5

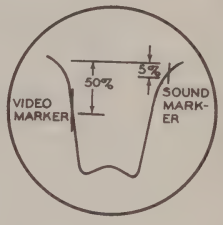
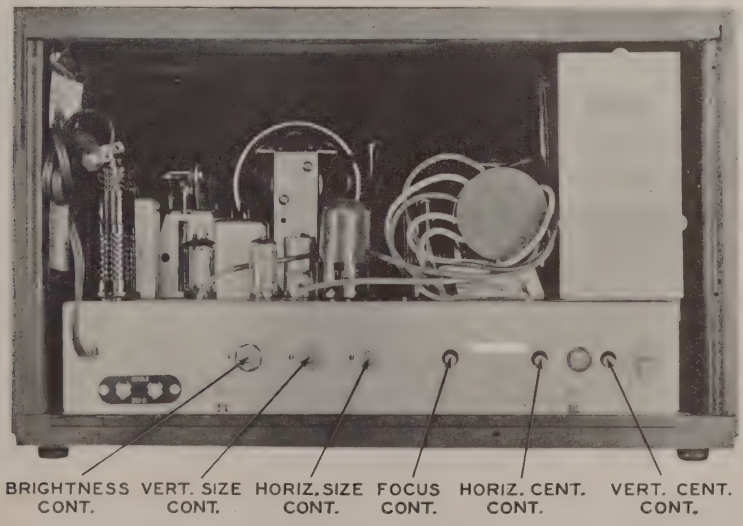


FIG. 6



CABINET-REAR VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BH6	-.1VDC	.4VDC	85VAC	90VAC	100VDC	125VDC	0V		
V 2	6J6	125VDC	85VDC	95VAC	90VAC	§1.5 VDC	0V	2VDC		
V 3	6BA6	-.1VDC	1.1VDC	65VAC	58VAC	115VDC	115VDC	1.1VDC		
V 4	6BA6	-.1VDC	1.1VDC	58VAC	50VAC	115VDC	115VDC	1.1VDC		
V 5	6BA6	0V	1.7VDC	50VAC	45VAC	115VDC	115VDC	1.7VDC		
V 6	6AL5	0V	0V	12VAC	6VAC	4.2VDC	0V	-4VDC		
V 7	12AU6	0V	0V	35VAC	45VAC	40VDC	125VDC	0V		
V 8	12AU6	-.4VDC	0V	35VAC	24VAC	115VDC	115VDC	0V		
V 9	19T8	-.4VDC	-.6VDC	-.4VDC	24VAC	6VAC	-.6VDC	0V	-.4VDC	43VDC
V 10	25L6GT	0V	90VAC	93VDC	100VDC	0V	0V	65VAC	8VDC	
V 11	12AU6	0V	4.5VDC	45VAC	55VAC	87VDC	125VDC	4.5VDC		
V 12	12SN7GT	0V	80VDC	2.5VDC	2.5VDC	31VDC	2.5VDC	36VAC	24VAC	
V 13	12SN7GT	0V	295VDC	16VDC	0V	265VDC	16VDC	45VAC	36VAC	
V 14	12SN7GT	-1VDC	30VDC 65VDC	4.2VDC	0V	105VDC	4.2VDC	24VAC	12VAC	
V 15	50L6GT	0V	60VAC	125VDC	125VDC	-9.2VDC	0V	110VAC	1VDC	
V 16	50L6GT	0V	60VAC	130VDC	100VDC	-13.5 VDC	0V	6VAC	0V	
V 17	1B3GT	* DO NOT MEASURE								

	PINS	1	2	3	4	5	6	7	8	9	10	11	14
V18	7JP4	6VAC	120VDC	4.5VDC	0V	*	0V	*	*	*	*	*	0V

* Do Not Measure.
§TAKEN WITH VACUUM TUBE VOLTMETER

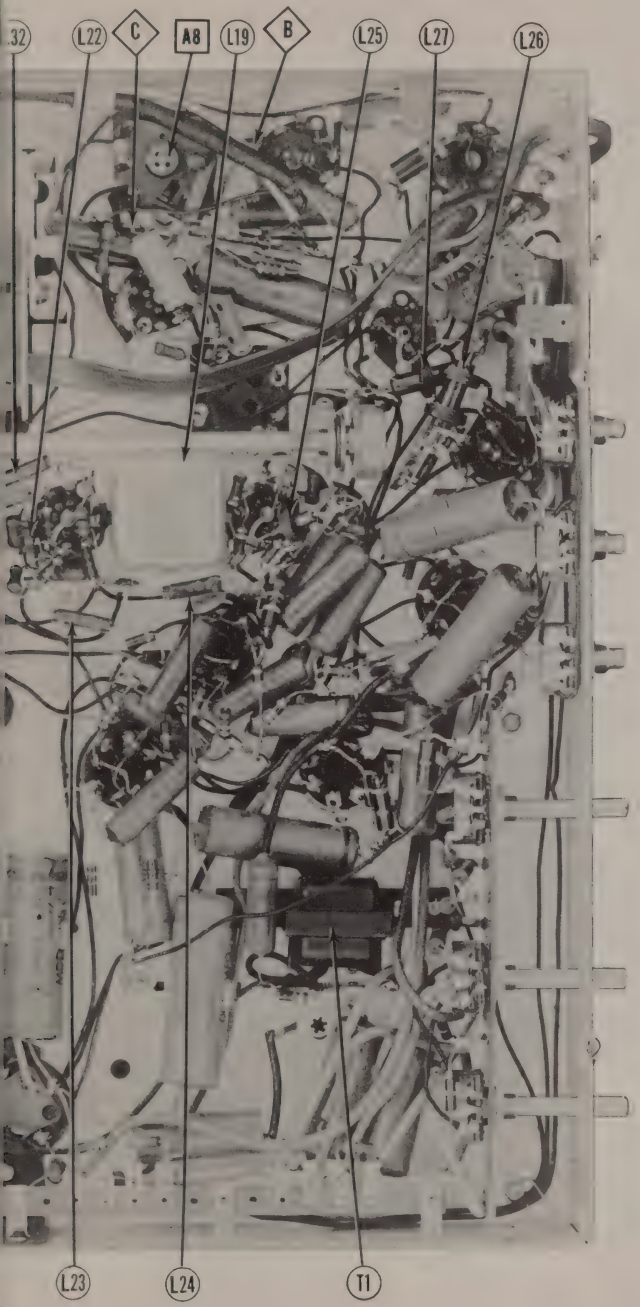
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BH6	900KΩ	68Ω	42Ω	38Ω	†5.5KΩ	†1000Ω	5.6KΩ		
V 2	6J6	†1000Ω	†5.5KΩ	39Ω	38Ω	10KΩ	10KΩ	220Ω		
V 3	6BA6	1 Meg.	5.6KΩ	33Ω	31Ω	†1000Ω	†1000Ω	82Ω		
V 4	6BA6	850KΩ	5.6KΩ	30Ω	28Ω	†1000Ω	†1000Ω	82Ω		
V 5	6BA6	3Ω	5.6KΩ	27Ω	24Ω	†1000Ω	†1000Ω	82Ω		
V 6	6AL5	1.5Ω	100KΩ	4.5Ω	1.5Ω	3.3KΩ	Inf.	5KΩ		
V 7	12AU6	7Ω	1.5Ω	28Ω	36Ω	†8.2KΩ	†63Ω	1.5Ω		
V 8	12AU6	470KΩ	0Ω	28Ω	19Ω	†1000Ω	†1000Ω	0Ω		
V 9	19T8	Inf.	33KΩ	Inf.	19Ω	1.5Ω	33KΩ	0Ω	10 Meg.	†470KΩ
V 10	25L6GT	Inf.	37Ω	†800Ω	†620Ω	470KΩ	0Ω	33Ω	180Ω	
V 11	12AU6	1 Meg.	22KΩ	36Ω	44Ω	†220KΩ	†63Ω	22.2KΩ		
V 12	12SN7GT	10KΩ	†18KΩ	1000Ω	350KΩ	17 Meg.	1000Ω	20Ω	13Ω	
V 13	12SN7GT	10 Meg.	25.6 Meg.	68KΩ	10 Meg.	25 -6 Meg.	68KΩ	24Ω	20Ω	
V 14	12SN7GT	100KΩ	†300KΩ †50KΩ	1.2KΩ	18KΩ	†8.2KΩ	1.2KΩ	13Ω	4.5Ω	
V 15	50L6GT	Inf.	40Ω	†100Ω	†100Ω	2.2 Meg	0Ω	58Ω	62Ω	
V 16	50L6GT	Inf.	40Ω	†150Ω	†2.7KΩ	15KΩ	Inf.	1.5Ω	0Ω	
V 17	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP 100KΩ

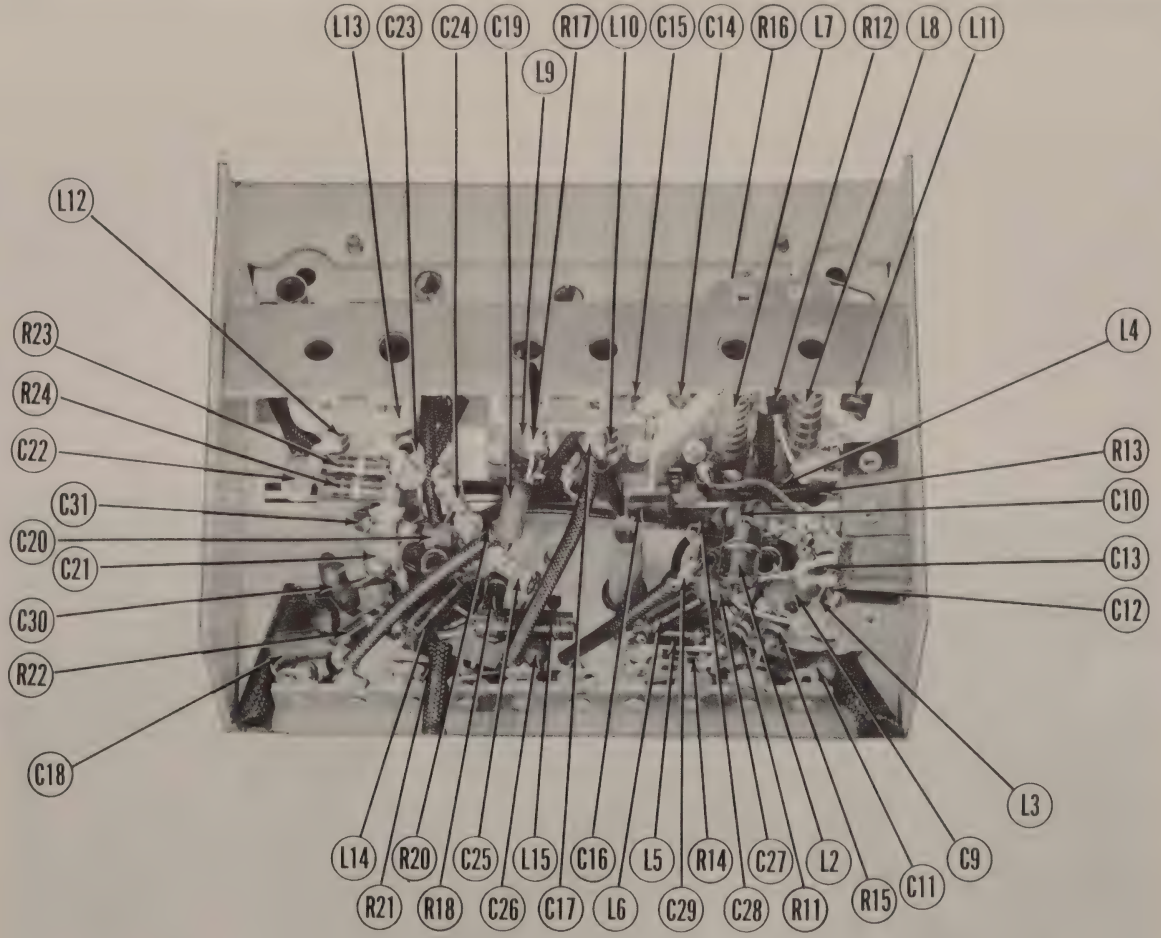
	PINS	1	2	3	4	5	6	7	8	9	10	11	14
V18	7JP4	1.5Ω	†180KΩ	22KΩ	Inf.	25 Meg.	Inf.	40 Meg.	40 Meg.	35 Meg	42 Meg 40 Meg	40 Meg	0Ω

† Measured From Output Of M1.

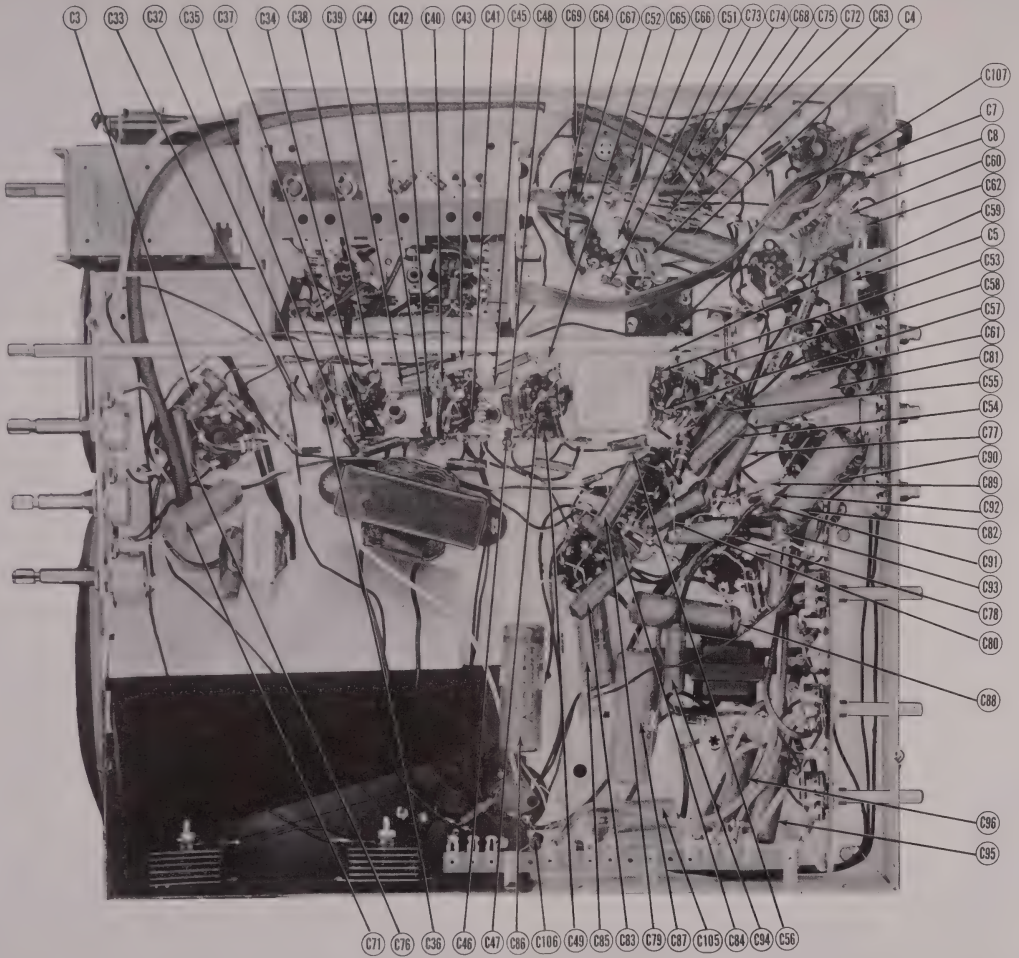
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



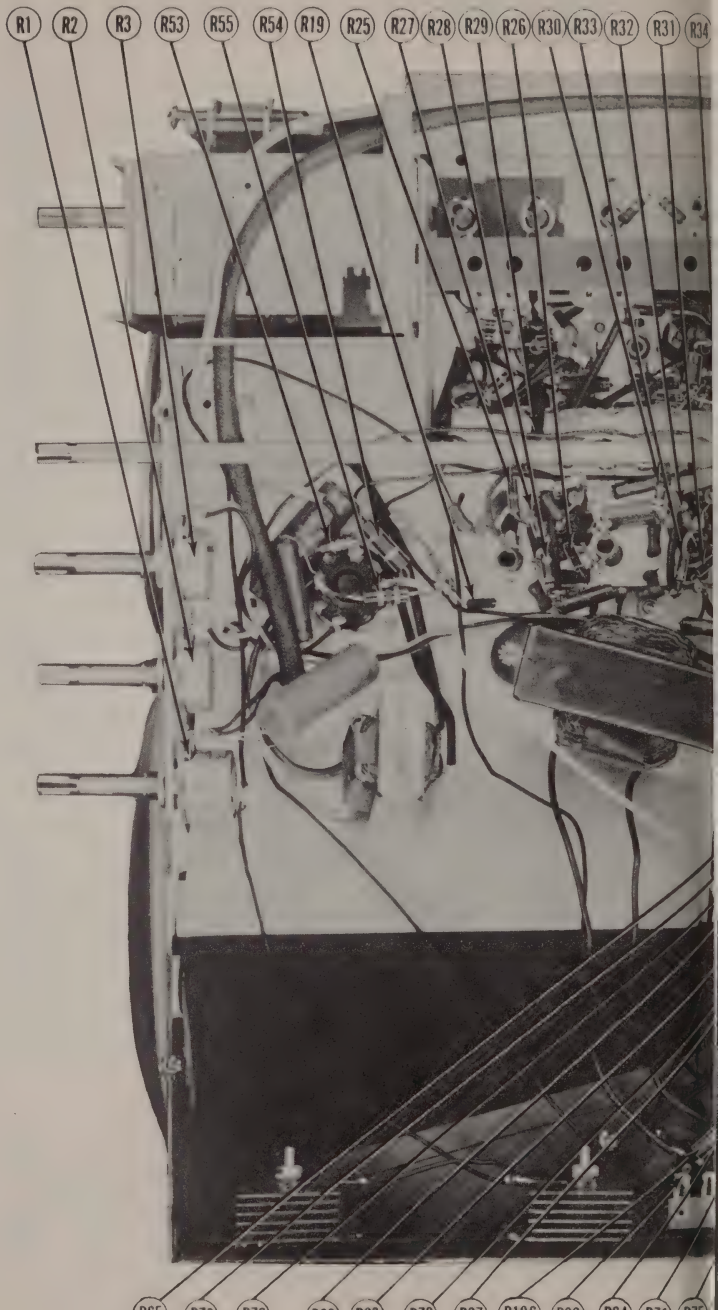
OR AND ALIGNMENT IDENTIFICATION



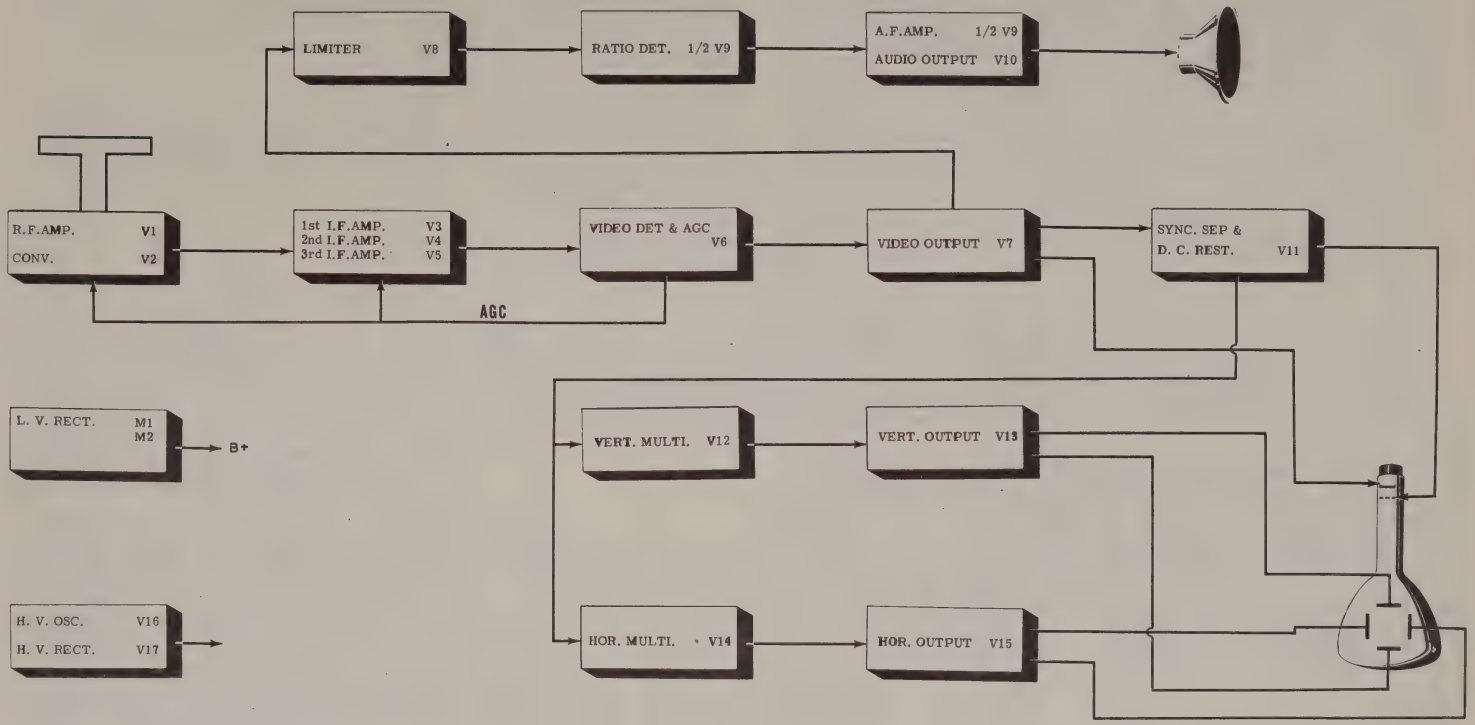
RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW



BLOCK DIAGRAM

PARTS LIST AND

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6BH6	6BH6	7CM	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF	6BA6	6BA6	7BK	
V4	2nd Video IF	6BA6	6BA6	7BK	
V5	3rd Video IF	6BA6	6BA6	7BK	
V6	Detector	6AL5	6AL5	6BT	
V7	Video Output	12AU6	12AU6	7BK	
V8	Limiter	12AU6	12AU6	7BK	
V9	Ratio Det.-AF Amp.	19T8	19T8	9E	
V10	Audio Output	25L6GT	25L6GT	7AC	
V11	Sync. Sep.-DC Rest.	12AU6	12AU6	7BK	
V12	Vert. Multi-vibrator	12SN7GT	12SN7GT	8BD	
V13	Vert. Output	12SN7GT	12SN7GT	8BD	
V14	Hor. Multi-vibrator	12SN7GT	12SN7GT	8BD	
V15	Hor. Output	50L6GT	50L6GT	7AC	
V16	HV Osc.	50L6GT	50L6GT	7AC	
V17	HV Rectifier	1B3GT	1B3GT	3C	
V18	Picture Tube	7JP4	7JP4	14G	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	120	150	B-8H-15684	AFH24D			TVL-44	Filter
C2A	120	150	B-8C-15948	AFH2412D4A	UP 55515C†			▲ Filter
B	60	150						■ Filter
C	20	25					UT-121	Output Cathode Bypass
C3	10	150	A-8C-11495	PRS150/12	BR1015		UT-121	Output Decoupling
C4	10	50	A-8C-13132	PR50/10	BR105		TVA-14	Stabilizing Cap
C5	10	50	A-8C-13132	PR50/10	BR105		TVA-14	V. Amp. Cath. Bypass
C6	10	150	A-8C-11495	PRS150/12	BR1015		UT-121	Dyn. Limiter Cath. *
C7	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	Ant. Coupling
C8	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	Ant. Coupling
C9	220		C-8C-16045	GP220M		GP2K-200		RF Coupling
C10	220		C-8C-16045	GP220M		GP2K-200		RF Coupling
C11	1000		C-8C-13201	GP1000M		GP2L-001		RF Bypass
C12	1000		C-8C-13201	GP1000M		GP2L-001		RF Supp. Bypass
C13	1000		C-8C-13201	GP1000M		GP2L-001		RF Screen Bypass
C14	.5		A-8C-12495 -7					RF Coupling
C15	.5		A-8C-12495 -7					RF Coupling
C16	1		A-8C-12495 -2					RF Coupling
C17	1000		C-8C-13201	GP1000M		GP2L-001		RF Plate Dec.
C18	1000		C-8C-13201	GP1000M		GP2L-001		RF Bypass
C19	1000		C-8C-13201	GP1000M		GP2L-001		RF Bypass
C20	2.2		A-8C-12495 -4					Osc. Coupling
C21	51		C-8C-11891	GP51K				Osc. Feedback
C22	7		C-8C-15224					Fixed Trimmer
C23	51		C-8C-11891	GP51K				Osc. Grid Cap
C24	25		C-8C-15737	GP25K				Osc. Feedback
C25	10		C-8C-11789	CN10DNP0		NP0K-10		Osc. Feedback
C26	1000		C-8C-13201	GP1000M		GP2L-001		RF Bypass
C27	1000		C-8C-13201	GP1000M		GP2L-001		RF Bypass
C28	220		C-8C-16045	GP220M		GP2K-200		RF Fil. Bypass
C29	220		C-8C-16045	GP220M		GP2K-200		RF Fil. Bypass
C30	220		C-8C-16045	GP220M		GP2K-200		Conv. Fil. Bypass
C31	220		C-8C-16045	GP220M		GP2K-200		Conv. Fil. Bypass
C32	47	500	C-8F3-109	1468-00005	5W5Q5	GP1K-50	1FM-45	IF Coupling
C33	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	Conv. Plate Dec.
C34	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	AGC Filter
C35	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	RF Bypass
C36	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	1st IF Supp. Bypass *
C37	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	1st IF Decoupling
C38	100		C-8C-11734	GP100M	5W5T1	GP1K-100	1FM-31	1st IF Fil. Bypass
C39	47	500	C-8F3-109	1468-00005	5W5Q5	GP1K-50	1FM-45	IF Coupling
C40	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	AGC Filter
C41	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	2nd IF Decoupling
C42	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	2nd IF Supp. Bypass *
C43	100		C-8C-11734	GP100M	5W5T1	GP1K-100	1FM-31	2nd IF Fil. Bypass
C44	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	RF Bypass
C45	47	500	C-8F3-109	1468-00005	5W5Q5	GP1K-50	1FM-45	IF Coupling
C46	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	RF Bypass
C47	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	3rd IF Cath. Bypass
C48	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	3rd IF Supp. Bypass *
C49	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	3rd IF Decoupling
C50	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	RF Bypass
C51	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	RF Bypass
C52	100		C-8C-11734	GP100M	5W5T1	GP1K-100	1FM-31	3rd IF Fil. Bypass
C53	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	IF Coupling
C54	.01	200	C-8D-11738	P488-01	PTE4S1	821-01	TM-11	AGC Filter
C55	.1	200	C-8D-10771	P288-1	PTE4P1		TM-1	AGC Filter
C56	5000		A-8C-13962	BPD-5	1D5D5	811-005	29C125	RF Bypass
C57	5		C-8C-12166	C15CNP0	5W5V5	NP0K-5	MS-55	V Diode Filter
C58	1000		C-8C-13201	GP1000M	1W5D1	GP2L-001	1FM-21	DAGC Decoupling
C59	100		C-8C-11734	GP100M	5W5T1	GP1K-100	1FM-31	V DET-AGC Fil. Bypass
C60	.25	200	C-8D-10775	P488-25	GT2P25		TC-2	Video Coupling
C61	.05	200	C-8D-10770	P288-05	PTE4S5		TM-15	Video Coupling
C62	.01	200	C-8D-11738	P488-01	PTE4S1	821-01	TM-11	Pic Tube Cath. Dec.
C63	47	500	C-8F3-109	1468-00005	5W5Q5	GP1K-50	1FM-45	S. IF Coupling
C64	1500		C-8C-11731	GP1500M	1W5D15	GP2L-0015	1FM-215	S. IF Decoupling
C65	330	500	C-8F3-119	1468-0003	5W5T3	GP2K-300	1FM-335	Diode Load Cap
C66	.002	600	C-8D-10778	P688-002	PTE6D2	GP2M-002	TM-22	De-emphasis
C67	.01	200	C-8D-11738	P488-01	PTE4S1	821-01	TM-11	Audio Coupling

CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	
C68	1500		C-8C-11731	GP1500M	1W5D15	G
C69	10			C10DNP0	5R5Q1	N
C70	1000		C-8C-13201	GP1000M	1W5D1	G
C71	.1	400	C-8D-10760	P488-1	PTE4P1	
C72	.01	200	C-8D-11738	P488-01	PTE4S1	8
C73	.01	200	C-8D-11738	P488-01	PTE4S1	8
C74	220		C-8C-11733	GP220M	5W5T25	G
C75	.01	200	C-8D-11738	P488-01	PTE4S1	8
C76	.03	200	C-8D-10992	P488-03	PTE6S3	
C77	.05	200	C-8D-10770	P288-05	PTE4S5	
C78	.005	600	C-8D-10935	P688-005	PTE6D5	8
C79	.01	200	C-8D-11738	P488-01	PTE4S1	8
C80	.02	200	C-8D-11304	P488-02	PTE4S2	
C81	.02	1600		P1688-02	PTE16S2	
C82	.02	1600		P1688-02	PTE16S2	
C83	.0014	1600		P1688-0015		
C84	.0008	1600				
C85	.01	1600	B-8D-13693	P1688-01	PTE16S1	
C86	.005	6000	B-8D-13549	7584-005	PTE60D5	
C87	.005	6000	B-8D-13549	7584-005	PTE60D5	
C88	.1	600	C-8D-10983	P688-1	PTE6P1	
C89	68	500	C-8F3-111			
C90	330	500	C-8F3-119			
C91	750	500	C-8F3-246	1469-00075		
C92	750	500	C-8F3-246	1469-00075		
C93	.1	200	C-8D-10771	P288-1	PTE4P1	
C94	.01	200	C-8D-11738	P488-01	PTE4S1	8
C95	.001	6000	B-8D-13523	7584-001	PTE60D1	
C96	.001	6000	B-8D-13523	7584-001	PTE60D1	
C97	330	500	C-8F3-119			
C98	.01	200	C-8D-11738	P488-001	PTE4S1	8
C99	.02	200	C-8D-11304	P488-02	PTE4S2	
C100	470	500	C-8F3-121	1469-0005	5R5T5	
C101	10000		A-8C-16019	BPD-10	PTE4S1	8
C102	1000		C-8C-13201	GP1000M	1W5D1	G
C103	.001	6000	B-8D-13523		PTE60D1	
C104	.001	6000	B-8D-13523		PTE60D1	
C105	.1	400	C-8D-10760	P488-1	PTE4P1	
C106	1000		C-8C-13201	GP1000M	1W5D1	G
C107	.01	200	C-8D-11738	P488-01	PTE4S1	8
C108	1000			GP1000M	1W5D1	G

* Not Used In All Models.
† Parallel Sections To Obtain Desired Capacity.

CON

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROS PART N
R1A	1 Meg.	½	A-10A15666	Q13-137	AM-63-Z
B	Shaft		Not Req.	Not Req.	KSS-3
C	Switch		Not Req.	76-1	SW-A
R2A	250KΩ	½	B-10B15671	Q11-130	AM-55-S
B	Shaft		Not Req.	Not Req.	KSS-3
R3A	100KΩ	½	B-10B15670	Q11-128	AM-49-S
B	Shaft		Not Req.	Not Req.	KSS-3
R4A	5000Ω	½	A-10B15272	Q11-114	AM-19-S
B	Shaft		Not Req.	GQ	DFS-½
R5	50KΩ	½	A-10B15672	Q11-123	M-44-S
R6	2 Meg.	½	A-10B16250	Q11-139	M-83-S
R7	250KΩ	½	A-10B15614	Q11-130	M-55-S
R8	2 Meg.	½	B-10B15627		
R9	2 Meg.	½	B-10B15627		
R10	2 Meg.	½	B-10B15627		

RESIS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: IRC PART No.
R11	100KΩ	½	C-9B1-86	
R12	5600Ω	½	C-9BL-71	
R13	1000Ω	½	C-9B1-13	
R14	68Ω	½	C-9B1-48	
R15	5600Ω	½	C-9B1-71	
R16	5600Ω	½	C-9B1-71	
R17	10KΩ	½	C-9B1-74	
R18	10KΩ	½	C-9B1-74	
R19	1000Ω	½	C-9B1-13	
R20	10KΩ	½	C-9B1-74	
R21	220Ω	½	C-9B1-54	
R22	5600Ω	½	C-9B1-71	
R23	10Ω	½	C-9BL-38	
R24	10Ω	½	C-9B1-38	
R25	10KΩ	½	C-9B1-19	
R26	1000Ω	½	C-9B1-13	
R27	5600Ω	½	C-9B1-71	
R28	82Ω	½	C-9B1-133	
R29	220KΩ	½	C-9B1-27	BTS-220K
R30	47KΩ	½	C-9B1-82	
R31	1000Ω	½	C-9B1-13	
R32	5600Ω	½	C-9B1-71	BTS-5600
R33	82Ω	½	C-9B1-133	
R34	47KΩ	½	C-9B1-82	
R35	1000Ω	½	C-9B1-13	
R36	5600Ω	½	C-9B1-71	
R37	68Ω	½	C-9B1-131	
R38	220KΩ	½	C-9B1-27	BTS-220K
R39	470KΩ	½	C-9B1-94	BTS-470K
R40	100KΩ	½	C-9B1-86	BTS-100K

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6BH6	6BH6	7CM	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF	6AH6	6AH6	7BA	
V4	2nd Video IF	6BA6	6BA6	7BK	
V5	3rd Video IF	6BA6	6BA6	7BK	
V6	Detector	6AL5	6AL5	6BT	
V7	Video Output	12AU6	12AU6	7BK	
V8	Limiter	12AU6	12AU6	7BK	
V9	Ratio Det.-AF Amp.	19T8	19T8	9S	
V10	Audio Output	2S150GT	2S150GT	7AC	
V11	Sync. Sep.-DC Rest.	12AU6	12AU6	7BK	
V12	Vert. Multi-vibrator	12SN7GT	12SN7GT	8BD	
V13	Vert. Output	12SN7GT	12SN7GT	8BD	
V14	Hor. Multi-vibrator	12SN7GT	12SN7GT	8BD	
V15	Hor. Output	2AU4GT	2AU4GT	7AC	
V16	HV Osc.	6CG7/6J7	6CG7/6J7	7AC	
V17	HV Rectifier	1B4GT	1B4GT	2C	
V18	Picture Tube	21EP4	21EP4	14S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	120	150	B-BH-15684	AFH24D			TVL-44	Filter
C2A	120	150	B-BC-15948	AFH2412D4A	UP 5658150M			◆ Filter
	6	150						■ Filter
	25	50						Output Cathode Bypass
C3	50	150	A-BC-11495	PRS150/12	BR1015		UT-121	Output Decoupling
C4	50	50	A-BC-13132	PRS50/10	BR10D		TVA-14	Stabilizing Cap
C5	50	50	A-BC-13133	PRS50/10	BR10D		TVA-14	V. Amp. Cath. Bypass
C6	50	150	A-BC-11495	PRS150/12	BR1015		UT-121	Video Limiter Cath. *
C7	.1	400	C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	Ant. Coupling
C8	.1	400	C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	Ant. Coupling
C9	120		C-BC-16045	SPF20M		GP2K-200		RF Coupling
C10	120		C-BC-16045	SPF20M		GP2K-200		RF Coupling
C11	.005		C-BC-13201	GP1000M		GP2L-001		RF Bypass
C12	.005		C-BC-13201	GP1000M		GP2L-001		RF Bypass
C13	.1		A-BC-12436					RF Coupling
C14	.1		A-BC-12436 -2					RF Coupling
C15	.1		A-BC-12436 -2					RF Coupling
C16	.1		A-BC-12436 -2					RF Coupling
C17	.005		C-BC-13201	GP1000M		GP2L-001		RF Plate Dec.
C18	.005		C-BC-13201	GP1000M		GP2L-001		RF Bypass
C19	.1		C-BC-13201	GP1000M		GP2L-001		RF Bypass
C20	.1		C-BC-12436 -4					Osc. Feedback
C21	.01		C-BC-11891	GP61K		GP1K-50		Osc. Grid Cap
C22	.01		C-BC-11891	GP61K		GP1K-50		Osc. Grid Cap
C23	3.3		C-BC-11894	SPF3M				Osc. Feedback
C24	10		C-BC-11895	CN10ND		MPGK-10		Osc. Feedback
C25	.005		C-BC-13201	GP1000M		GP2L-001		RF Bypass
C26	.005		C-BC-13201	GP1000M		GP2L-001		RF Bypass
C27	.005		C-BC-11894	SPF3M		GP2K-200		RF Fil. Bypass
C28	.005		C-BC-16045	SPF20M		GP2K-200		RF Fil. Bypass
C29	.005		C-BC-16045	SPF20M		GP2K-200		Conv. Fil. Bypass
C30	.005		C-BC-16045	SPF20M		GP2K-200		Conv. Fil. Bypass
C31	.005	200	C-BC-13205	GP1K50	5S5Q5	GP1K-50	LFM-45	IF Coupling
C32	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	Conv. Plate Dec.
C33	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	AGC Filter
C34	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	RF Bypass
C35	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	1st IF Supp. Bypass *
C36	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	1st IF Decoupling
C37	.005		C-BC-13204	SP500M	5S5T5	GP1K-100	LFM-31	1st IF Fil. Bypass
C38	.005	500	C-BC-13205	1W5B-00005	5S5Q5	GP1K-50	LFM-45	IF Coupling
C39	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	AGC Filter
C40	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	2nd IF Decoupling
C41	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	2nd IF Supp. Bypass *
C42	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	2nd IF Fil. Bypass
C43	.005		C-BC-13204	SP100M	5S5T5	GP2L-001	LFM-21	RF Bypass
C44	.005	500	C-BC-13205	1W5B-00005	5S5Q5	GP1K-50	LFM-45	IF Coupling
C45	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	RF Bypass
C46	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	3rd IF Cath. Bypass
C47	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	3rd IF Supp. Bypass *
C48	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	3rd IF Decoupling
C49	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	RF Bypass
C50	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	RF Bypass
C51	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	3rd IF Fil. Bypass
C52	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	4th IF Decoupling
C53	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	RF Bypass
C54	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	RF Bypass
C55	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	RF Bypass
C56	.005		C-BC-13201	GP1000M	1W5D1	GP2L-001	LFM-21	RF Bypass
C57	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C58	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C59	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C60	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C61	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C62	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C63	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C64	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C65	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C66	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C67	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C68	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C69	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C70	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C71	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C72	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C73	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C74	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C75	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C76	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C77	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C78	.005		C-BC-13204	SP100M	5S5T5	GP1K-100	LFM-31	RF Bypass
C79	.01		C-BC-11738	P488-01		PT6A8	821-01	TVM-11	Integrator Net
C80	.02		C-BC-11304	P488-02		PT6A32		TVM-12	Vert. Mult. Feedback
C81	.02			P1688-02		PT6E32		VS-12	Vert. Discharge
C82	.02			P1688-02		PT6E32		VS-12	Vert. Coupling
C83	.0014			P1688-0015					Voltage Divider
C84	.0014								Voltage Divider *
C85	.01		B-BD-13693	P1688-01		PT6E181		VB-11	Vert. Coupling
C86	.005		C-BD-13549	7584-005		PT6E0D6		TVM-256	Vert. Coupling
C87	.005		B-BD-13549	7584-005		PT6E0D6		TVM-256	Vert. Coupling
C88	.1		C-BD-10993	P688-1		PT6E91		TM-1	Vert. Output Cath. Byp.
C89	.68		C-BF3-111						Hor. Sync. Coupling
C90	.33		C-BF3-119						Hor. Mult. Feedback
C91	.5		C-BF3-246	1469-00076					Hor. Discharge
C92	.5		C-BF3-246	1469-00076					Hor. Coupling
C93	.1		C-BD-10771	P288-1		PT6A91		TM-1	Hor. Output Cath. Byp.
C94	.01		C-BD-11738	P488-01		PT6A81	821-01	TM-11	Hor. Feedback
C95	.01		C-BD-13523	7584-001		PT6E0D1		TVM-216	Hor. Coupling
C96	.001		B-BD-13523	7584-001		PT6E0D1		TVM-216	Hor. Coupling
C97	.33		C-BF3-119						HV Osc. Grid Cap
C98	.01		C-BD-11738	P488-001		PT6A81	821-01	TM-11	HV Osc. Decoupling
C99	.02		C-BD-11304	P488-02		PT6A32		TM-12	HV Screen Byp.
C100	.0470		C-BF3-111	1469-00005		DR5T5		VS-35	Fixed Trimmer
C101	.03000		A-BG-16019	BFD-10		PT6A81	821-01	5861	RF Bypass
C102	.0100		C-BD-13201	GP1000M		1W5D1	GP2L-001	LFM-21	RF Bypass
C103	.0068	6000	B-BD-13523	7584-001		PT6E0D1		TVM-216	HV Filter
C104	.001	6000	C-BD-13523	7584-001		PT6E0D1		TVM-216	HV Filter
C105	.0100		C-BD-13201	GP1000M		1W5D1	GP2L-001	LFM-21	HV Power Supply Isol.
C106	.0100		C-BD-13201	GP1000M		1W5D1	GP2L-001	LFM-21	RF Bypass
C107	.01	200	C-BD-11738	P488-01		PT6A81	821-01	TM-11	Line Filter
C108	.0100			GP1000M		1W5D1	GP2L-001	LFM-21	RF Bypass *

* Not Used In All Models.
† Parallel Sections To Obtain Desired Capacity.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	A-1QA15666	Q13-137	AM-53-Z	Volume Control
B	Shaft		Not Req.	Not Req.	KS3-S	Attach to R1A Per Instructions
C	Switch		Not Req.	76-1	SW-A	Attach to R1A Per Instructions
R2A	25.0K	½	B-10815671	Q11-130	AM-55-S	Vert. Hold Control
B	Shaft		Not Req.	Not Req.	KS3-S	Attach to R2A Per Instructions
R3A	100K	½	B-10815970	Q11-123	AM-49-S	Horiz. Hold Control
B	Shaft		Not Req.	Not Req.	KS3-S	Attach to R3A Per Instructions
R4A	5000	½	A-10815272	Q11-114	AM-19-S	Contrast Control
B	Shaft		Not Req.	JQ	DFS-F	Attach to R4A Per Instructions
R5	50K	½	A-10815672	Q11-123	M-44-S	Brightness Control
R6	2 Meg.	½	A-10815250	Q11-139	M-83-S	Vert. Size Control
R7	2.5M	½	A-10815614	Q11-130	M-55-S	Horiz. Size Control
R8	2 Meg.	½	B-10815627			Focus Control
R9	2 Meg.	½	B-10815627			Horiz. Centering Control
R10	2 Meg.	½	B-10815627			Vert. Centering Control

RESISTORS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	IDENTIFICATION CODES: ALL RESISTORS ARE - 10% UNLESS OTHERWISE STATED.
R11	10	½	C-981-66		RF Grid
R12	560	½	C-981-71		RF Plate
R13	1000	½	C-981-13		RF Screen Decoupling 20%
R14	68	½	C-981-48		RF Cathode
R15	560	½	C-981-71		RF Suppressor Grid
R16	560	½	C-981-71		RF Coil Shunt
R17	10K	½	C-981-74		Mixer Grid Coil Shunt
R18	10K	½	C-981-74		Mixer Grid
R19	1000	½	C-981-13		Mixer Plate Decoup. 20%
R20	10K	½	C-981-74		Osc. Grid
R21	220	½	C-981-54		Osc. Cathode
R22	560	½	C-981-71		Osc. Plate
R23	10	½	C-981-38		Parasitic Supp.
R24	47	½	C-981-38		Parasitic Supp.
R25	10K	½	C-981-19		1st IF Grid
R26	1000	½	C-981-13		1st IF Decoup. 20%
R27	560	½	C-981-71		1st IF Suppressor Grid See note 1
R28	82	½	C-981-153		1st IF Cathode 5%
R29	220K	½	C-981-27	BTS-220K	AGC Network
R30	47	½	C-981-82		2nd IF Grid
R31	1000	½	C-981-13		2nd IF Decoup. 20%
R32	560	½	C-981-71		2nd IF Suppressor Grid See note 1
R33	82	½	C-981-153		2nd IF Cathode 5%
R34	47	½	C-981-82		2nd IF Transformer Shunt
R35	1000	½	C-981-13		3rd IF Decoup. 20%
R36	560	½	C-981-71		3rd IF Suppressor Grid See note 1
R37	68	½	C-981-151		3rd IF Cathode 5%
R38	220K	½	C-981-27	BTS-220K	AGC Network
R39	470K	½	C-981-94	BTS-470K	AGC Network
R40	100K	½	C-981-86	BTS-100K	AGC Diode Load

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	IDENTIFICATION CODES
R41	100K	½	C-981-86	BTS-100K	Voltage Divider
R42	330K	½	C-981-88	BTS-330K	Voltage Divider
R43	150K	½	C-981-26	BTS-150K	Peaking Coil Shunt 20%
R44	10K	½	C-981-19	BTS-10K	Phase Correction 20%
R45	8200	½	C-981-73	BTS-8200	Video Output Plate
R46	470K	½	C-981-94		Limiter Grid
R47	1000	½	C-981-13		Limiter Decoup.
R48	22K	½	C-981-78	BTS-22K	De-emphasis
R49	330	½	C-981-60	BTS-330	Disc. Diode Load
R50	33K	½	C-981-80	BTS-33K	Limiter Diode Load See Note 1
R51	10 Meg.	½	C-981-37	BTS-10 Meg.	AF Grid
R52	470K	½	C-981-94	BTS-470K	AF Plate
R53	470K	½	C-981-94	BTS-470K	Output Grid
R54	1.5K	1	C-982-53	BW-1-180	Output Cathode
R55	560	1	C-982-59	BW-1-560	Filter
R56	1 Meg.	½	C-981-31	BTS-1 Meg.	Sync. Sep. Grid 20%
R57	330K	½	C-981-27	BTS-330K	Sync. Sep. Plate 20%
R58	180K	½	C-981-89	BTS-180K	Sync. Coupling Network
R59	27	½	C-981-55	BW-½-270	Sync. Sep. Cathode
R60	22K	½	C-981-78	BTS-22K	Sync. Sep. Cathode
R61	47K	½	C-981-82	BTS-47K	Voltage Divider
R62	150K	½	C-981-26	BTS-150K	Voltage Divider
R63	470	½	C-981-70	BTS-4700	Integrator
R64	470	½	C-981-70	BTS-4700	Integrator
R65	18K	½	C-982-77	BTA-18K	Vert. MV Plate
R66	4.7 Meg.	½	C-981-35	BTS-4.7 Meg.	Vert. MV Plate
R67	330	½	C-981-60	BTS-330K	Vert. MV Grid
R68	100	½	C-981-159	BTS-1000-5%	Vert. MV Cathode 5%
R69	6.8 Meg.	½		BTS-6.8 Meg.	Feedback
R70	10 Meg.	½	C-981-37	BTS-10 Meg.	Vert. Output Grid 20%
R71	5.6 Meg.	½	C-981-249	BTS-5.6Meg-5%	Vert. Output Plate 5%
R72	5.6 Meg.	½	C-981-249	BTS-5.6Meg-5%	Vert. Output Plate 5%
R73	10 Meg.	½	C-981-37	BTS-10 Meg.	Vert. Output Grid
R74	68K	½	C-981-84	BTS-68K	Vert. Output Cathode
R75	560	½	C-981-59	BTS-560	Differentiator
R76	18K	½	C-981-77	BTS-18K	Horiz. MV Grid
R77	8200	½	C-981-73	BTS-8200	Horiz. MV Plate
R78	47K	½	C-981-82	BTS-47K	Horiz. MV Plate
R79	100K	½	C-981-86	BTS-100K	Horiz. MV Grid
R80	12000	½	C-981-161	BTS-12000-5%	Horiz. MV Cathode 5%
R81	270	½	C-981-27	BTS-220K	Isolation
R82	2.2 Meg.	½	C-981-102	BTS-2.2 Meg	Horiz. Output Grid
R83	68	½	C-981-62		Horiz. Output Cathode
R84	2.2 Meg.	½	C-981-102	BTS-2.2 Meg	Feedback
R85	15K	½	C-981-76	BTS-15K	H V Osc. Grid
R86	27K	1	C-982-66	BTA-2700	H V Osc. Screen
R87	220K	½	C-981-27	BTS-220K	Isolation
R88	100	½	C-982-25		H V Filter
R89	100	½	C-981-25		H V Filament
R90	1 Meg.	½	C-981-31	BTS-1 Meg.	Isolation See note 1
R91	4.7 Meg.	½	C-981-35		Vert. Deflection Load
R92	4.7 Meg.	½	C-981-35		Vert. Deflection Load
R93	4.7 Meg.	½	C-981-35		Horiz. Deflection Load
R94	4.7 Meg.	½	C-981-35		Horiz. Deflection Load
R95	2.2 Meg.	½	C-981-102		Voltage Divider
R96	2.2 Meg.	½	C-981-102		Voltage Divider
R97	2.2 Meg.	½	C-981-102		Voltage Divider
R98	2.2 Meg.	½	C-981-102		Voltage Divider
R99	2.2 Meg.	½	C-982-239		Voltage Divider
R100	2.2 Meg.	1	C-982-239		Voltage Divider
R101	2.2 Meg.	1	C-982-239		Voltage Divider
R102	2.2 Meg.	1	C-982-239		Voltage Divider
R103	1.5 Meg.	1	C-982-235		Voltage Divider See note 1 5%
R104	10 Meg.	½	C-981-37		Voltage Divider 5%
R105	10 Meg.	½	C-981-37		Voltage Divider 20%
R106	10K	½	C-982-6	BW-2-150	Voltage Divider See note 1 20%
R107A	472	2	C-984-5	BW-2-47	Filter
B	682	1	C-982-130	BW-1-62	Filament String
R108	10K	½		BTS-10K	Filament String See note 1.
					Bias Network See note 1.

Note 1 - Not used in all models.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	SEC.	REPLACEMENT DATA: AIRLINE PART No.	STANCOR PART No.	CHICAGO PART No.	MERIT PART No.	NOTES
T1	270Ω 68Ω & 1102Ω		B-12M-15662				Hor. Deflection Transformer.

TRANSFORMER (H.V. OSC.)

ITEM No.	RATING: DC RESISTANCE PRI.	SEC.	REPLACEMENT DATA: PART No.	STANCOR PART No.	CHICAGO PART No.	MERIT PART No.	NOTES
T2	32	SEC. 1 G102 SEC. 2 G2	B-20-15567				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	SEC.	DC RES. PRI.	SEC.	REPLACEMENT DATA: AIRLINE PART No.	STANCOR PART No.	CHICAGO PART No.	MERIT PART No.	INSTALLATION NOTES
T3	2100Ω	3.5Ω	192Ω	.7Ω	B-12C-10074 -4	A-3876	RO-2	A-2928	

AIRLINE MODEL 94BR-3017A

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	AIRLINE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	3.5Ω	B-18A-15618	ST-113† MOD.P4-X	4A07†	† Trim flange and mounting bracket.
	CONE DIA.	V. C. DIA.				
SP2	3 7/8"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	AIRLINE PART No.	STANCOR PART No.	CHICAGO PART No.	MERIT PART No.	
L1	.185A	63Ω	2.6Henries	C-16A15624	C-2325	TR-4225	C-2991‡	‡ Drill one new mounting hole.

COILS (RF-IF)

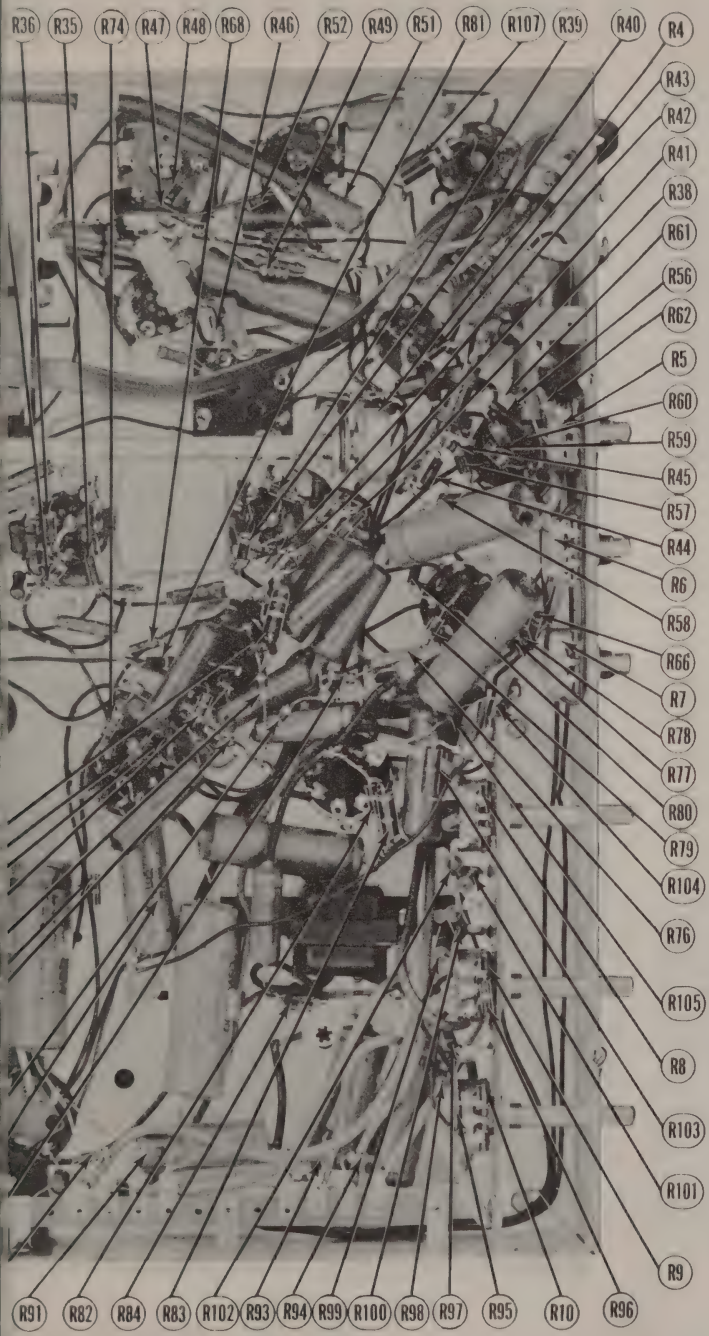
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	AIRLINE PART No.	MEISSNER PART No.	
L2	Ant. Coil	0Ω		A-201-15676		
L3	High Band Antenna	0Ω				Consists of No. 18 straight, bare, tinned copper wire.
L4	Low Band Antenna	0Ω				Consists of No. 18 straight, bare, tinned copper wire.
L5	RF Choke	.2Ω		A-16A-16637		
L6	RF Choke	.2Ω		A-16A-16637		
L7	Low Band RF	0Ω		B-13E-12046		
L8A	High Band RF	0Ω		A-201-15675		Uses core with green end.
B	High Band RF	0Ω		B-13D-12155		Uses core with red end.
L9	Low Band RF	0Ω		B-13E-12046		
L10A	High Band RF	0Ω		A-201-15675		Uses core with green end.
B	High Band RF	0Ω		B-13D-12155		Uses core with red end.
L11	RF Choke	.2Ω		A-16A-16637		
L12	Low Band Osc.	0Ω		B-13D-12155		
L13	High Band Osc.	0Ω		A-13D-12045		
L14	RF Choke	.2Ω		A-16A-16637		
L15	RF Choke	.2Ω		A-16A-16637		
L16	1st IF	.1Ω		B-201-15612		
L17	2nd IF	.1Ω		B-201-15612		
L18	3rd IF	.1Ω		B-201-15612		
L19	4th IF	.1Ω		B-201-15945		
L20	RF Choke	1.5Ω		A-16A-16637		
L21	RF Choke	1.5Ω		A-16A-16637		
L22	RF Choke	1.5Ω		A-201-15608		
L23	RF Choke	1.5Ω		A-16A-16637		
L24	RF Choke	1.5Ω		A-16A-16637		
L25	Peaking	7.2Ω		A-201-16170		
L26	Peaking	22Ω		A-201-16172		
L27	Peaking	9Ω		A-201-16171		
L28	Sound Take-Off Trans.	.5Ω	.5Ω	C-201-16155		
L29	Ratio Det. Trans.	4Ω	.5Ω	C-201-15717		
L30	RF Choke	24.5Ω		A-201-15556		
L31	RF Choke	20Ω		B-16A-13524		
L32	Fil. Choke	1.5Ω		A-16A-16637		
L33	Fil. Choke	1.5Ω		A-16A-16637		
L34	RF Choke	0Ω		A-201-16379		
L35	Fil.Choke	1.5Ω		A-16A-16637		Not used in all models.

SELENIUM RECTIFIER

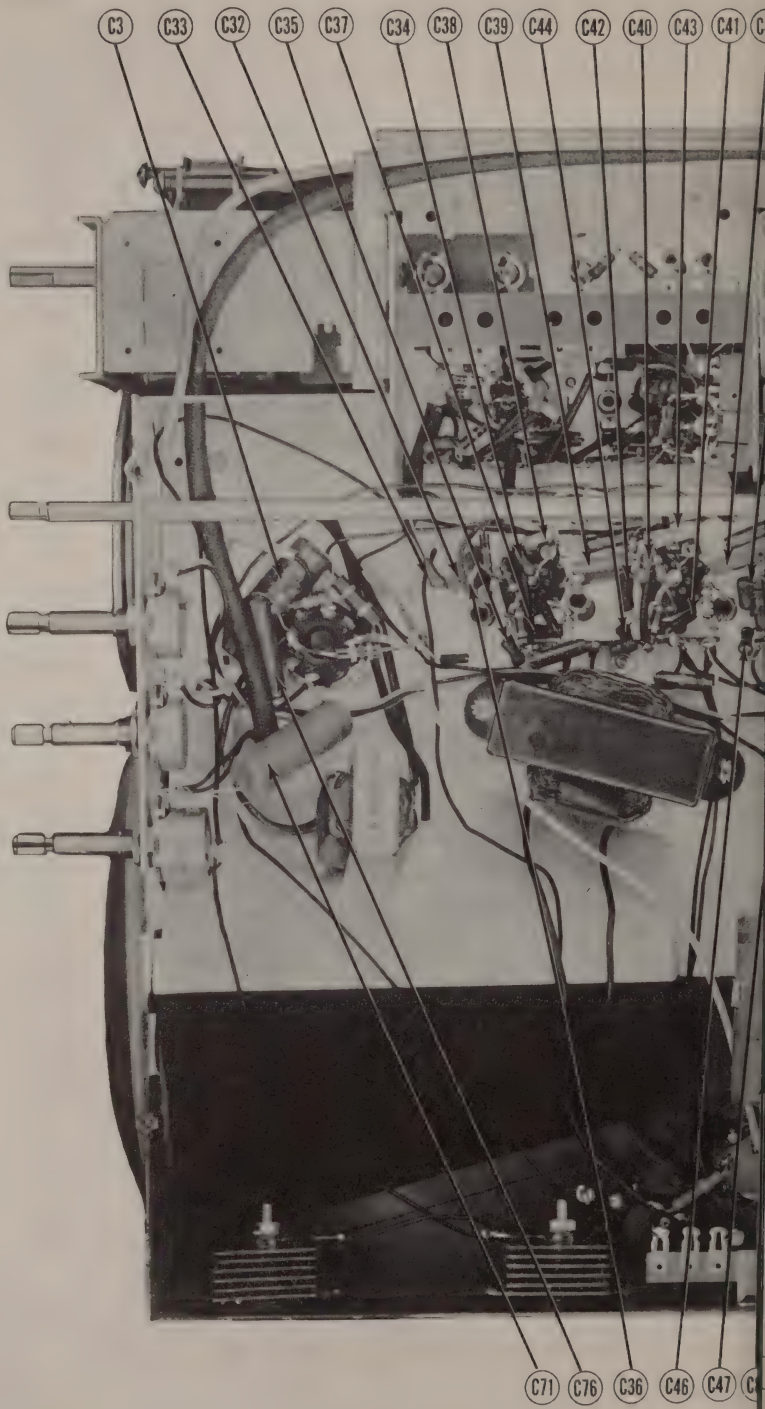
ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	AIRLINE PART No.			
M1	.105A	B-21J-15661			
M2	.105A	B-21J-15661			

MISCELLANEOUS

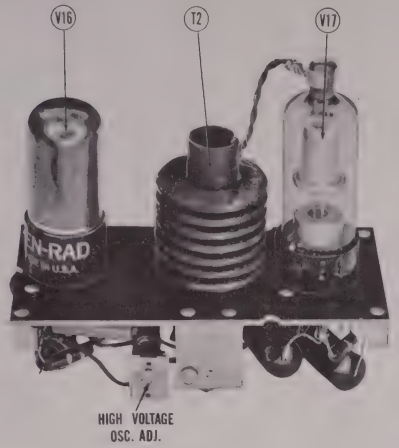
ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M3	Ballast Tube	B-9M-15822	
	Iron Core	A-51A-16693	For L19
	Knob	B-5B-15759-57	For station selector
	Knob	B-5B-15782-57	For contrast, Hor. Hold, Vert. Hold and on-off vol.
	Safety Glass	C-30M-15905	
	Iron Core	A-51A-15713	For L12 and L13
	Iron Core	A-51A-15714	For L8 and L10 having green end.
	Iron Core	A-51A-16391	For L8 and L10 having red end.
	Iron Core	A-51A-15715	For L7 and L9
	Core Mounting Clip	A-2M-16276	



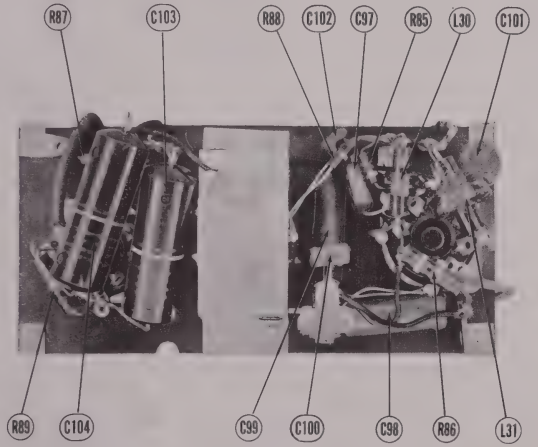
ESISTOR IDENTIFICATION



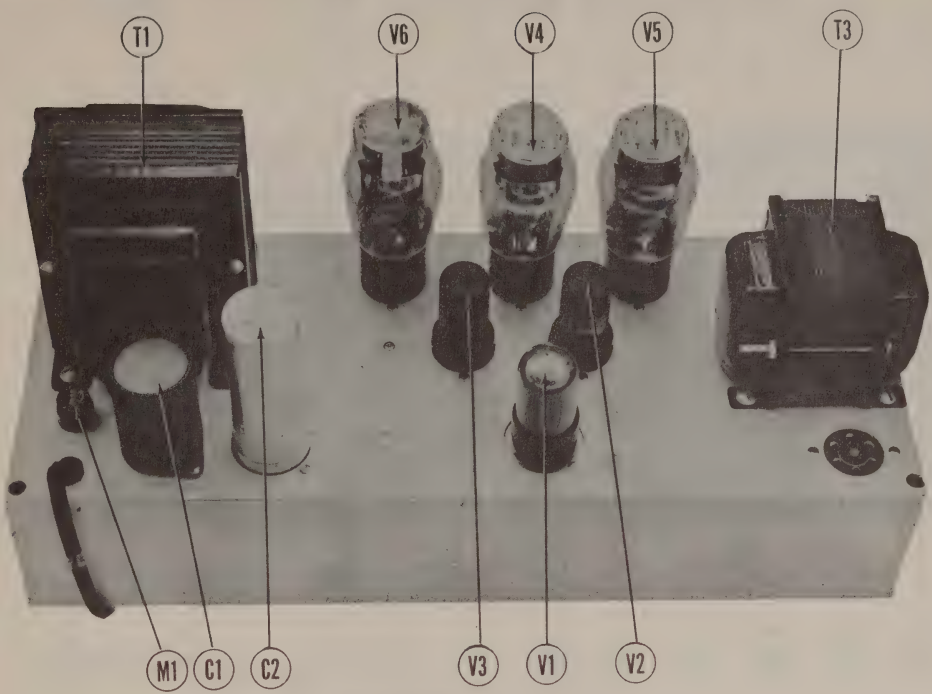
CHASSIS BOTTOM VIEW-C



HIGH VOLTAGE SUPPLY-TOP VIEW



HIGH VOLTAGE SUPPLY-BOTTOM VIEW



BROOK MODEL 12A

TRADE NAME	Brook, Model 12A
MANUFACTURER	Brook Electronics Inc., P. O. Box 491, Elizabeth, New Jersey
TYPE SET	AC Operated Audio Amplifier
TUBES(SIX)	Types 12SN7GT AF-Phase Inverter, (2) 6T5 Driver, (2) 2A3 Power Output, 5U4G Rectifier
POWER SUPPLY	105-125 Volts AC RATING .94 Amp. at 117 Volts AC

INPUT

The input signal is introduced through pin 4 of 6 prong power socket. Unless otherwise specified, The signal should be from a high impedance source (100KΩ or more). The condenser in series with the input is to reduce low frequency noises when the amplifier is used with phonograph or radio tuner. If it is desired, this capacitor may be shorted or replaced with a larger value capacitor to have good response at extremely low frequency.

OUTPUT

The output is connected to the octal socket marked "SPEAKER". The prongs of the socket are connected to impedance taps as shown on the schematic. More than one speaker may be used if properly matched to correct impedance.

BROOK
MODEL 12A

BROOK
MODEL 12A

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA BROOK PART No.	REPLACEMENT DATA STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	AF Amp. -Phase Inverter	6SN7GT	6SN7GT	8BD	
V2	Driver	6J5	6J5	6Q	
V3	Driver	6J5	6J5	6Q	
V4	Power Output	2A3	2A3	4D	
V5	Power Output	2A3	2A3	4D	
V6	Rectifier	5U4G	5U4G	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

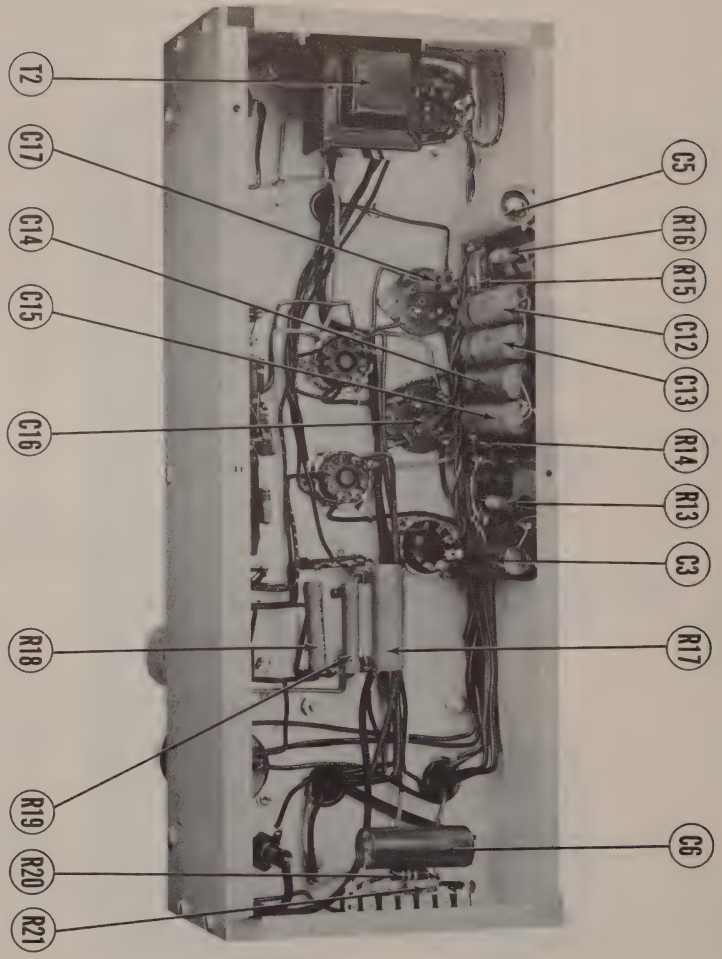
ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA BROOK PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	40	475		AF8X	UP2250 *		TVL-8	Filter
C2A	30	475		AF666X8D	UP1IDJ1128		TVL-55	▲ Filter
B	30	475						■ Filter
C	30	475						▲ Filter
C3	40	150		PRS150/40	BR4015A		UT-40	Bias Filter
C4	50	50		PRS50/50	BR505		TA-550	AF Amp. Cath. Bypass
C5	40	50		PRS50/50	BR505		TA-550	Driver Cath. Bypass
C6	40	150		PRS150/40	BR4015A		UT-401	Decoupling
C7	.01	600		P688-01	PTE6S1		TM-11	Audio Coupling
C8	1000	500		1467-001	1W5D1	GP2L-001	1FM-21	AF Amp. Plate Bypass
C9	1000	500		1467-001	1W5D1		1FM-21	Audio Coupling
C10	.1	600		P688-1	PTE6P1		TM-1	Audio Coupling
C11	.1	600		P688-1	PTE6P1		TM-1	Audio Coupling
C12	.1	600		P688-1	PTE6P1		TM-1	Audio Coupling
C13	.1	600		P688-1	PTE6P1		TM-1	Audio Coupling
C14	.1	600		P688-1	PTE6P1		TM-1	Audio Coupling
C15	.1	600		P688-1	PTE6P1		TM-1	Audio Coupling
C16	50	500		1468-00005	5W5Q5	GP1K-50	1FM-45	Output Plate Bypass
C17	50	500		1468-00005	5W5Q5	GP1K-50	1FM-45	Output Plate Bypass

* Parallel sections to obtain desired capacity.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA BROOK PART No.	IRC PART No.	IDENTIFICATION CODES
R1	470KΩ	½		BTS-470K	AF Grid
R2	4700Ω	½		BTS-4700	AF Cathode
R3	33KΩ	1		BTA-33K	AF Plate
R4	130Ω	½		BW-½-130	AF Cathode-Wire Wound
R5	1000Ω	½		BTS-1000	Feedback
R6	24KΩ	½		BTS-22K	Tone Compensation
R7	470KΩ	½		BTS-470K	Phase Inv. Grid
R8	4700Ω	½		BTS-4700	Phase Inv. Cathode
R9	33KΩ	1		BTA-33K	Phase Inv. Cathode
R10	33KΩ	1		BTA-33K	Phase Inv. Plate
R11	470KΩ	½		BTS-470K	Driver Grid
R12	470KΩ	½		BTS-470K	Driver Grid
R13	510Ω	1			Driver Cathode
R14	220KΩ	½		BTS-220K	Output Grid
R15	220KΩ	½		BTS-220K	Output Grid
R16	47KΩ	1		BTA-47K	Bias Network
R17	700Ω	20		DG-7000	Bias Network Wire Wound
R18	2000	10		AB-2000	Filter Wire Wound
R19	10KΩ	5		AB-10, 000	Filter Wire Wound
R20	240KΩ 5%	1			Decoupling
R21	33KΩ 5%	1		BTA-33K-5%	Bleeder

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
					BROOK PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
	PRI.	SEC. 1	SEC. 2	SEC. 3				
T1	117VAC at .94A	700V CT at 1.05A	5VAC at 3A	2.5VCT at 5A	W-140K	P-4049 ① & P-6134 ②		
		SEC. 4	SEC. 5					
		6.3VAC at .9A.	6.3VAC					

① Drill new mounting holes.
② Mount P-6134 under chassis.

TRANSFORMER (DRIVER)

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	BROOK PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
T2		3.6KΩ CT		W-143L				

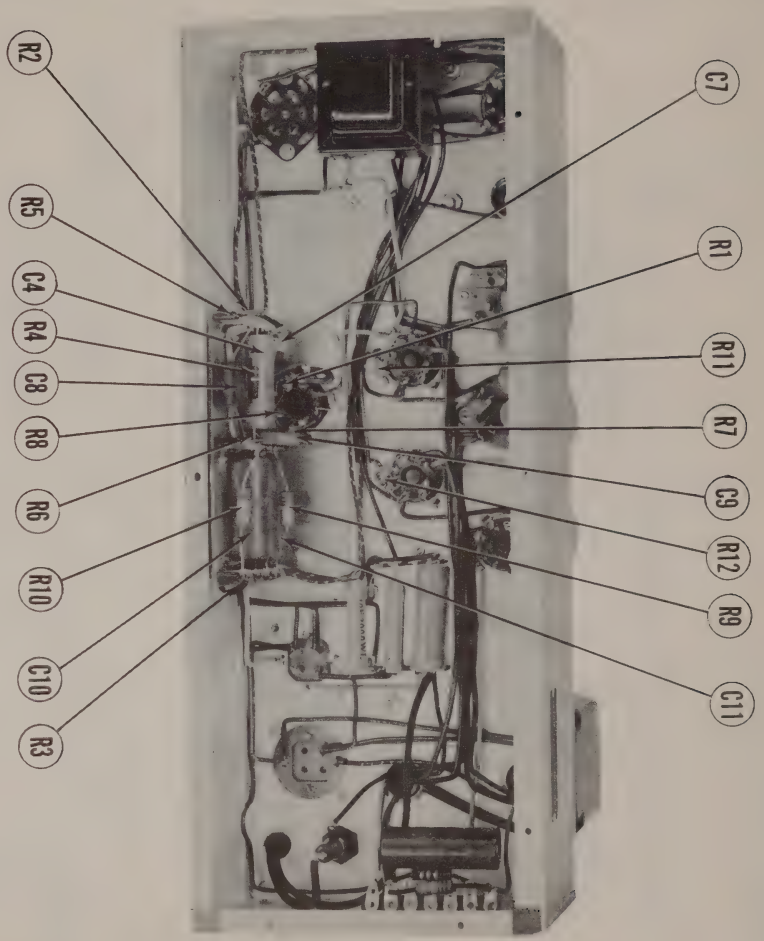
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		BROOK PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T3	4.5KΩ CT	500Ω 15Ω 8Ω 4Ω 2Ω	335Ω CT	46Ω .8Ω .5Ω .3Ω .2Ω	W-141K		A-3131 ①	PCO-80	① Drill new mounting holes.

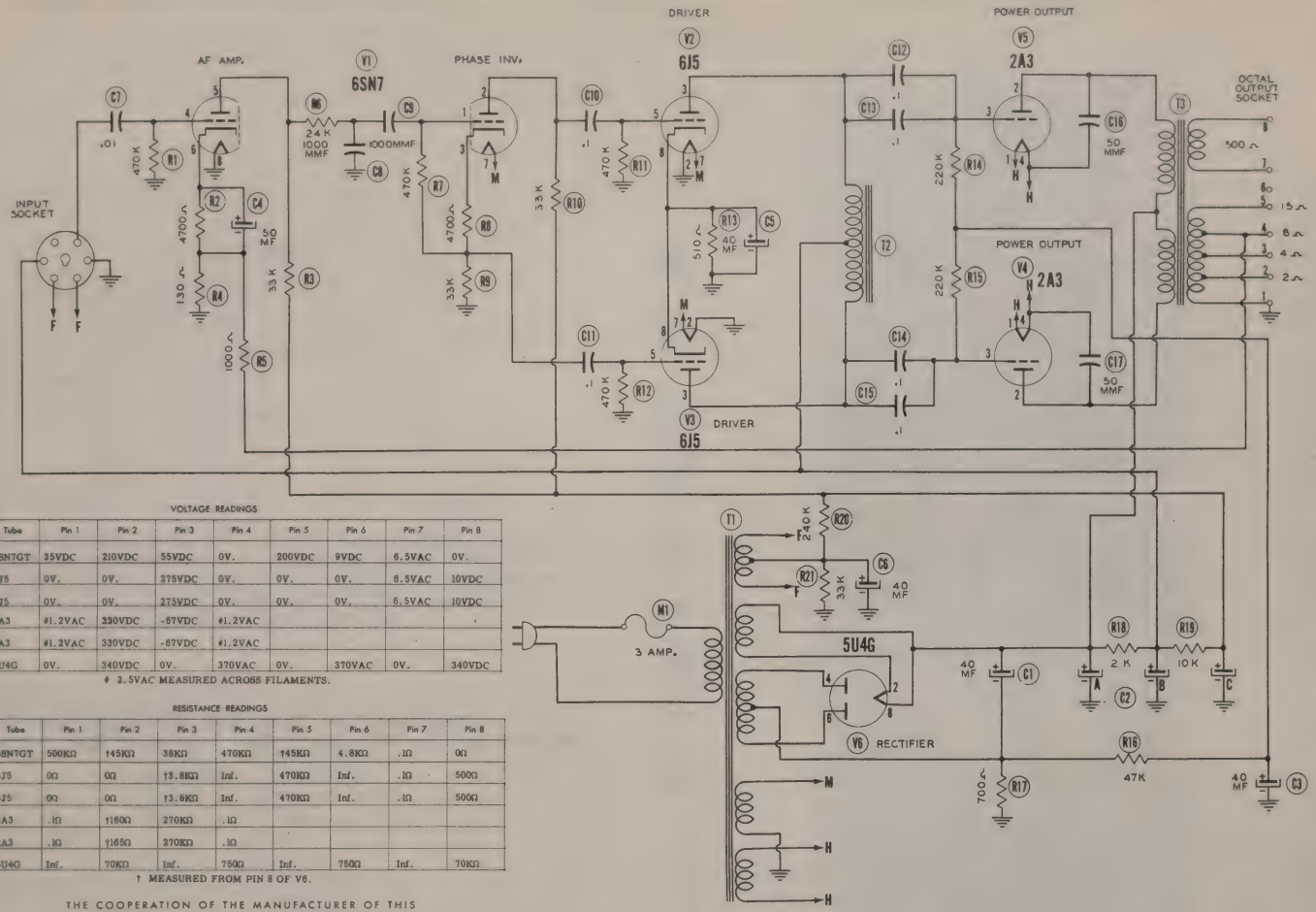
MISCELLANEOUS

ITEM No.	PART NAME	BROOK PART No.	NOTES
M1	Fuse		Type 3AG, 3Amp.

CHASSIS—BOTTOM VIEW



BROOK MODEL 12A



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SN7GT	35VDC	210VDC	55VDC	0V.	200VDC	9VDC	6.5VAC	0V.
V 2	6J5	0V.	0V.	275VDC	0V.	0V.	0V.	6.5VAC	10VDC
V 3	6J5	0V.	0V.	275VDC	0V.	0V.	0V.	6.5VAC	10VDC
V 4	2A3	#1.2VAC	330VDC	-67VDC	#1.2VAC				
V 5	2A3	#1.2VAC	330VDC	-67VDC	#1.2VAC				
V 6	5U4G	0V.	340VDC	0V.	370VAC	0V.	370VAC	0V.	340VDC

2.5VAC MEASURED ACROSS FILAMENTS.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SN7GT	500KΩ	†45KΩ	38KΩ	470KΩ	†45KΩ	4.8KΩ	.1Ω	0Ω
V 2	6J5	0Ω	0Ω	†3.8KΩ	Inf.	470KΩ	Inf.	.1Ω	500Ω
V 3	6J5	0Ω	0Ω	†3.8KΩ	Inf.	470KΩ	Inf.	.1Ω	500Ω
V 4	2A3	.1Ω	†160Ω	270KΩ	.1Ω				
V 5	2A3	.1Ω	†165Ω	270KΩ	.1Ω				
V 6	5U4G	Inf.	70KΩ	Inf.	750Ω	Inf.	750Ω	Inf.	70KΩ

† MEASURED FROM PIN 8 OF V6.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Proper output load connected.

45 RPM RECORD CHANGER

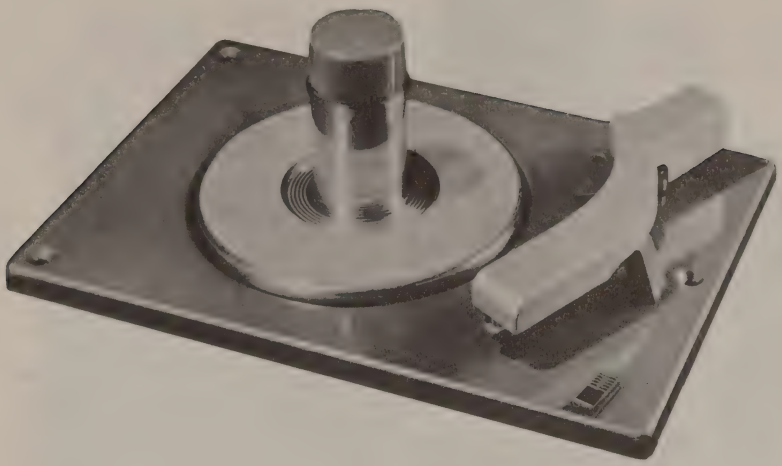

FIGURE 1—TOP VIEW

CRESCENT 6 SERIES—
45 RPM RECORD CHANGER

GENERAL INFORMATION

The Crescent 6-Series, 45 RPM changer is designed to play and change automatically the new small-diameter (6⅞″), fine-groove phonograph records. It will handle up to eight records, in sequence, at a loading. This changer is of the new "Spindle-Loading," rapid-changing type. It is designed to operate from a supply of 110-volt, 60-cycle AC. The last record will be repeated until the changer is turned off.

Manufactured by

CRESCENT INDUSTRIES, INC.

4140 WEST BELMONT AVENUE, CHICAGO 41, ILLINOIS

EXPORT: SCHEEL INTERNATIONAL, INC., CHICAGO 18, ILLINOIS, U.S.A.

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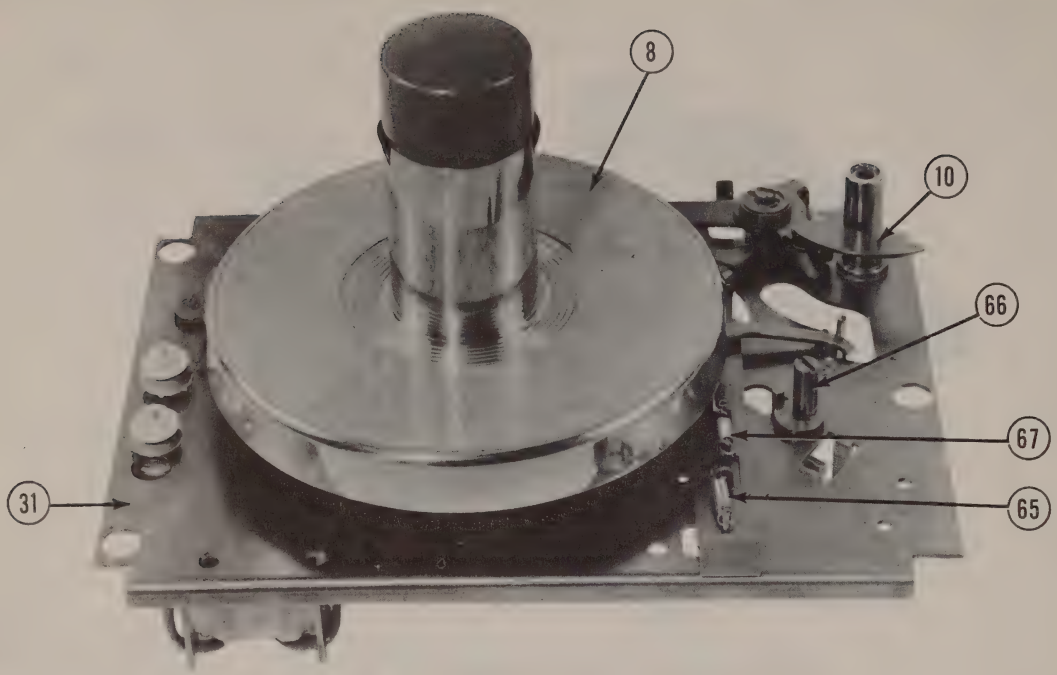


FIGURE 2

AUTOMATIC OPERATION

To operate this changer, be sure the mechanism is out of cycle and the pickup arm is on the arm rest before loading.

2. Remove the needle guard.

3. Place a series of the new small-diameter (6⅞"), fine-groove records on the spindle, allowing them to come to a rest on the record supports (6)—part of assembly (5 and 6).

4. Apply power to the drive motor (80).

5. Push the reject control knob (18) forward and let go. The mechanism will automatically play, in sequence, one side of each record stacked on the separator shelves. The last record will be repeated until the changer is turned off.

6. To reject a record being played, pull the reject knob (18) away from tone arm reset and release.

7. To repeat a record being played, remove all remaining records from the separator shelf (6). The remaining record will continue to repeat until additional records are replaced on the spindle, or the changer is turned off.

8. At conclusion of playing and as the last record is being repeated, lift the tone arm from the record and place on arm rest; then turn the changer off.

Caution

1. Do not handle the tone arm while the mechanism is in cycle.

2. Do not use force to release a jam.

3. Do not try to remove the records on the turntable if the turntable is stopped in cycle.

4. Do not try to operate the mechanism if the separator knives (4) protrude from the center post when the mechanism is out of cycle.

Apply power to the turntable; as the turntable revolves, press gently against the protruding discs (4) until they disappear inside the spindle. Do not do this during a change cycle.

CHANGE CYCLE

The change cycle is started by either pulling the reject control knob (18) away from the tone arm rest, which actuates the reject plate (63 and 64) moving the trip pawl (76) into tripping position, or by the action of the trip lever assembly (53), pushing the trip pawl (76) into tripping position, as the tone

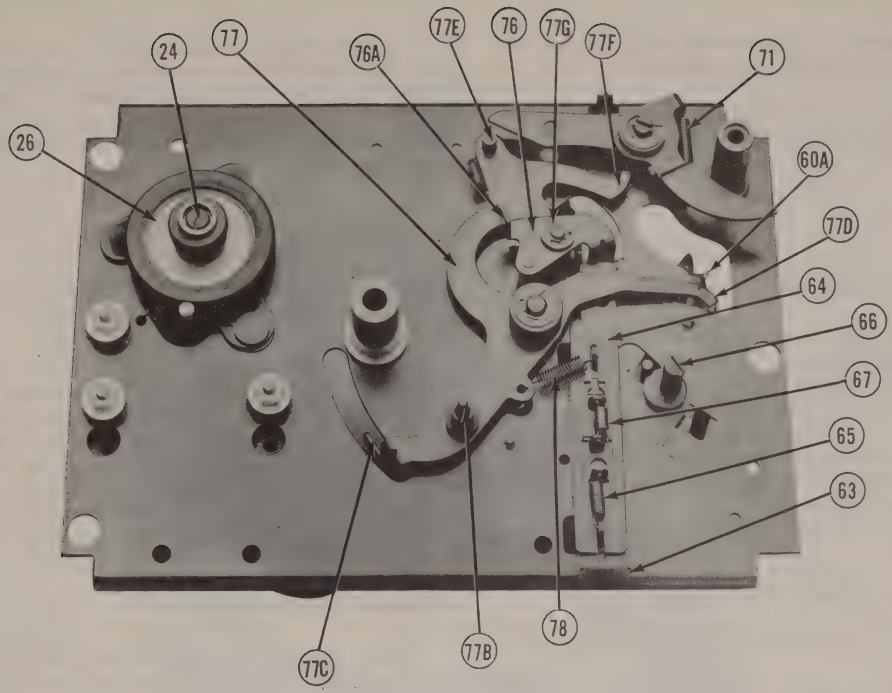


FIGURE 3

arm moves into the tripping groove of the record.

As the turntable rotates, a small projection (8A) extending from the underside of the turntable contacts the end of the trip pawl (76). Upon contact, the stud on the trip pawl (76) is forced against the main lever assembly (77) causing the follower stud (77B), Figure 3, of the main lever (77) to be forced through the slot and into the cycling cam groove (8B), Figure 5, thus starting the change cycle.

The change cycle operation is very rapid, due to the fact that it takes only one revolution of the turntable to complete a cycle. Therefore, as the follower stud (77B) moves in the cam track (8B), the following operations take place:

1. Finger (77D) of the main lever (77) moves away from the pawl (60A).

2. The end of the main lever (77C), extending below the motor board, moves away allowing the muting switch (49) to close.

3. At the same time, the stud (77E) pushes against the tone arm lift lever (70), which, in turn, raises the tone arm.

4. The end (77F) of the main lever (77) contacts the stud (53A) on the trip lever (53), starting the tone arm on its outward movement and end (77G) resets the trip pawl (76). The stud (53A) then moves against the lever assembly (60); therefore, as the tone arm reaches its outermost position, the tone arm is locked in position by the latch (60A), clamping the stud (53A) on the tone arm return lever (53).

5. While the tone arm is moving outward, the end (77C) moves in to block the rotation of the star wheel (43) and the shaft and gear assembly (7). Since the turntable continues to rotate while the star wheel and shaft remain stationary, the two small gears of the assembly (5 and 6) rotate around the gear of the gear and shaft assembly (7). This action is necessary to cause the shelves to recede, due to the eccentricity of the two small gears (6A), and the shelves to pivot out to select the lower record of the stack and to support the remaining records while the bottom record drops to the turntable.

At this point of rotation of the turntable, the main lever (77) is reversed in direction.

1. The end (77F) retains contact with the stud (53A) on the trip lever to stabilize the inward movement of the tone arm which is being pushed in by the return lever (60). This inward movement of the tone arm is stopped by stud (60B) of the return lever (60) coming in contact with the eccentric adjusting stud (66), thus positioning the tone arm for set down.

2. The stud (77E) moves away from the lever (70) lowering the tone arm to the record.

3. The stud (77B) of the main lever is now pulled through the slot in the cam by the force of the spring (78).

4. As the main lever is being pulled out of the cam track, end (77C) is moved away from the star wheel (43), end (77D) moves against the pawl (60A), thus unlatching the tone arm, and end (77C) then opens the muting switch (49). This completes the change cycle.

ADJUSTMENTS

Tone Arm Set Down

Normally, the set-down position is adjusted by turning the eccentric adjusting stud (66), Figures 2 and 3, made accessible through the hole (AA) in the motorboard (exploded view). If the pickup lands on the music grooves of the record, turn the stud slightly clockwise; turn counter-clockwise if the arm lands too near the edge of the record. However, if for any reason the trip lever (53) is loose on the shaft (15), the set-down position must be adjusted as follows:

1. Place a record on the turntable.

2. Set the adjusting stud (66) in a neutral position.

3. Move the reject knob (18) forward and release.

4. Turn the turntable clockwise, by hand, until the tone arm starts to lower. At this point, the lever (53) is held by the pawl (60A) of the lever assembly. Be sure screw (56) is loose enough to slide lever (53).

5. Push up on the lever (53) and down on the tone arm (11), leaving approximately .010″ vertical play.

6. While holding the lever (53) in position, move the tone arm over the starting groove of the record.

7. Tighten the clamp screw (56).

8. Turn the power on, push the reject knob forward, and observe the landing point.

9. A finer adjustment may be made by turning the adjusting stud (66) as described in the first part of the set-down adjustment.

Tone Arm Height

The correct height of the tone arm (11), while out of cycle, is approximately 1/16″ between the needle and the motorboard (17). To obtain this adjustment, bend the lug (15A) *exploded view* in the direction needed for proper height.

The maximum height of the tone arm, during the change cycle, is approximately ¾″ between the needle and the top of the turntable. This adjustment may be made by turning the adjusting stud (68). Turning the stud clockwise will raise the arm, and counterclockwise will lower the arm. This height-adjusting stud (68) is made accessible through the hole (BB) in the motorboard (exploded view).

Timing of Separator Knives

1. Make certain the two gears (6A) are meshed with the gear of the gear and shaft assembly (7).

2. Loosen the two set screws (42) sufficiently to permit the star wheel (43) to rotate without disturbing the shaft (7).

3. Position the separator knives as shown in Figure (6).

4. Move the reject knob (18) forward and release. Rotate the turntable slowly, by hand, until the end (77C) of the main lever moves in far enough so when the star wheel (43) is rotated it contacts the end (77C).

5. Tighten the set screws and check the adjustment by running the changer through several change cycles.

The separator knives must rotate 360° and return to the starting position, as indicated in Figure (6).

Automatic Tripping Adjustment

The changer should trip when the needle leaves the last playing groove. The adjustment is obtained by bending the long end of the trip pawl (76).

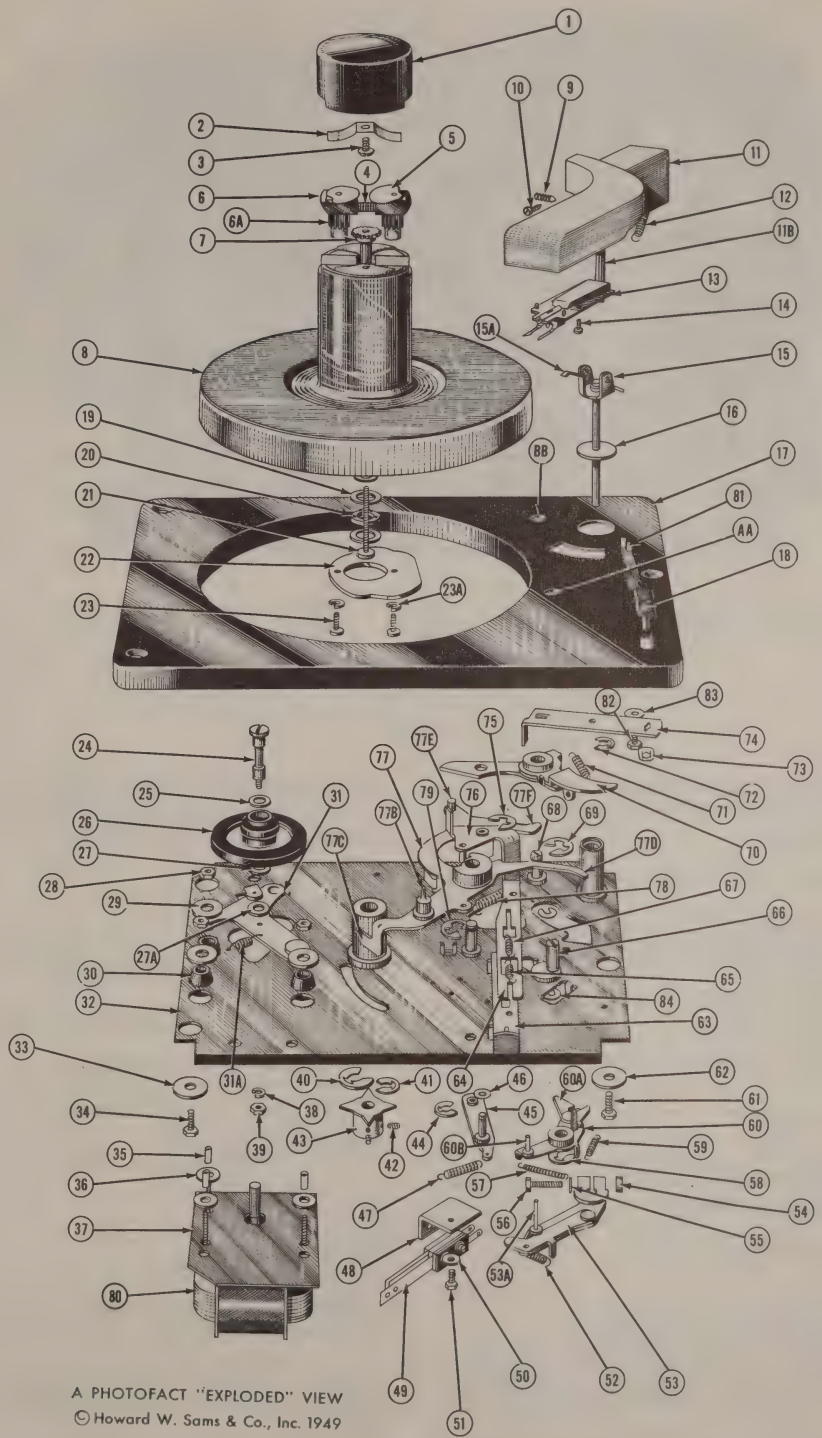
TROUBLES

Fails to Trip

1. Stud (8A) of the turntable, Figure 5, broken off.

2. The dog (76A), Figure 3, bent, thereby not coming in contact with the stud (8A).

3. The long end on the trip pawl (76) bent away



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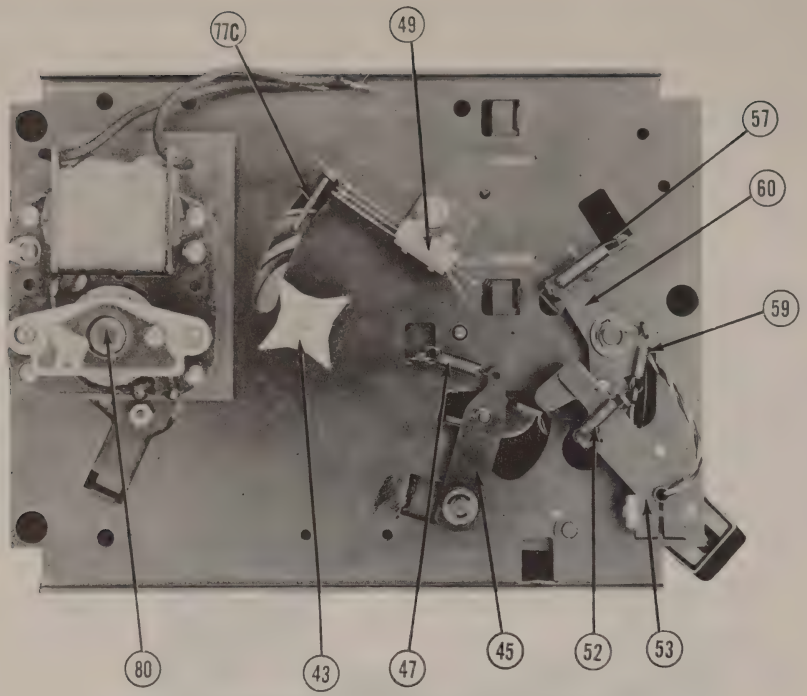


FIGURE 4

from the point of contact of the trip lever (53) for automatic tripping and the reject plate (64) for manual tripping.

4. Trip lever (53) loose on the tone arm shaft (15).

(a) For proper adjustment of this trouble, see "Tone Arm Set Down" under "ADJUSTMENTS."

5. Spring (52) loose.

6. Spring (47) loose.

Failure to Cycle

1. The stud on the trip pawl (76) that actuates the main lever bent or broken.

2. Follower stud (77B) broken.

Stalling During the Change Cycle

1. Turntable cam (22) off center, not leaving enough space for the follower stud (77B) to pass in the groove.

2. Spring (57) loose. This condition may allow the stud (53A) to pass behind the pawl (60A).

3. Oil and grease on rubber idler wheel and turntable rim; clean with carbon tetrachloride.

Wow (Speed Variation)

1. Idler wheel (26) binding on tight bearing stud (24).

2. Grease on idler wheel and turntable rim.

3. Idler wheel lever (31) binding.

4. Idler wheel lever spring loose.

5. Defective motor.

6. Turntable binding.

Repeats Grooves

1. Bind in tone arm pivot shaft, no vertical play. See "Tone Arm Set Down"—Items (4 and 5).

2. Lug (15A) bent too high not allowing tone arm to rest on record. See "Tone Arm Height" under "ADJUSTMENTS."

3. Spring (12) tension too great.

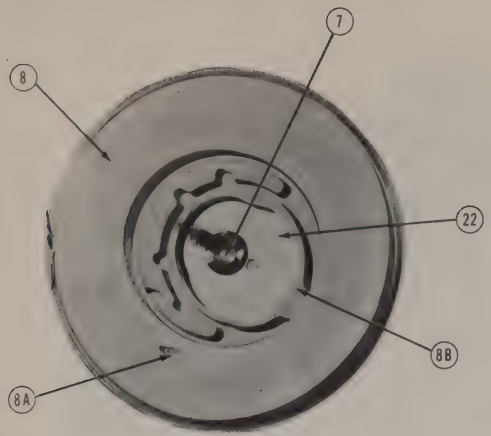


FIGURE 5

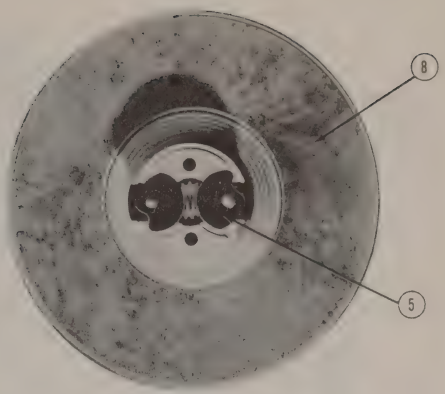


FIGURE 6

4. Pivot stud (9) too tight causing binding.

Continuous Tripping

1. Spring (78) missing.
2. Trip plate (63) binding.

Improper Landing of Tone Arm

1. Lever (60) binding in pivot.
2. Spring (59) loose.
3. Main lever end (77D) bent.
4. Stud (53A) loose.
5. Eccentric stud (66) loose.
6. Spring (57) missing.

Record Fails to Drop to Turntable

1. Star wheel (43) loose on shaft (7). See "Timing of Separator Knives" under "ADJUSTMENTS."

Records Drop On or Hit Tone Arm

1. Star wheel (43) improperly timed. See "Timing of Separator Knives" under "ADJUSTMENTS."

No Sound During Playing

1. Defective Cartridge (13).
2. Defective wiring.
3. Check position of muting switch (49) with changer out of cycle.
4. Defective amplifier.

Changer Trips Before End of Cycle

1. The long end of the trip pawl (76) bent. See "Automatic Tripping Adjustment."

Failure to Trip Manually

1. Spring (67) loose.
2. Turned up end of slide (63) bent in.

LUBRICATION

Additional lubrication should not be required for a long period of time; however, in cases of unusual use, or high operating temperature, the changer should be lubricated as follows:

1. Light machine oil (SAE No. 10) should be used to oil the bearings of the drive motor.
2. Use a good light grease on all bearing surfaces except the motor bearings; on all other sliding surfaces.

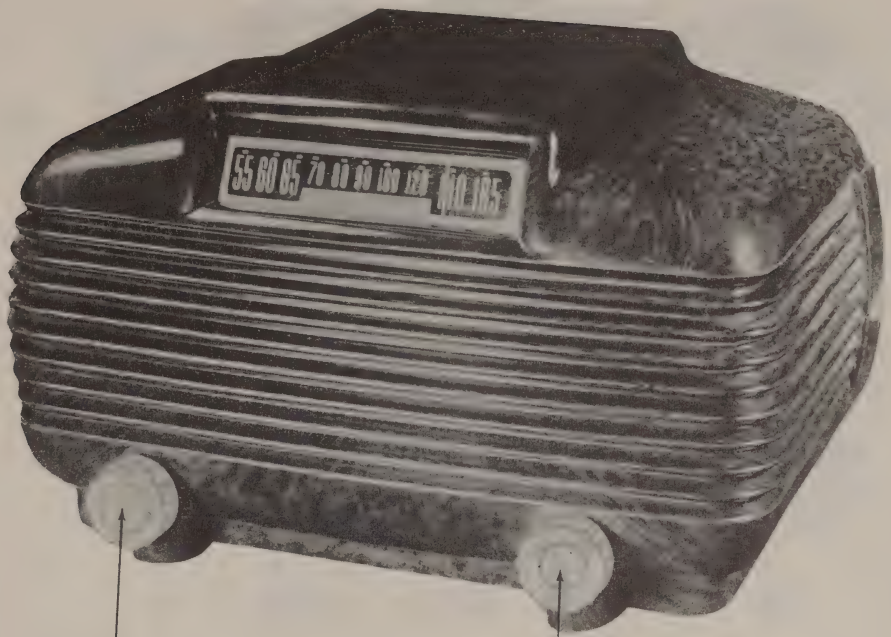
Caution

Do not oil or grease the record separator knives. Avoid over lubrication. Do not allow grease or oil to come in contact with rubber idler wheel (26), the drive motor shaft, or the turntable rim. All grease, oil, or any other foreign material should be cleaned from these parts with carbon tetrachloride or naphtha.

PARTS LIST

Ref. No.	Part No.	Description	No. Used
1	3R3	Spindle nose	1
2	4R9	Flat spring, spindle nose	1
3	6R9	6-32 x ¼" RHM screw	1
4	4R7	Coil spring (separator bolt spring)	1
5	RA18	Separator and bolt assembly	1
6	RA18	Separator and bolt assembly	1
7	RA19	Gear and shaft assembly	1
8	RA20	Turntable and shaft assembly (less mat)	1
	7R7	Turntable mat.	
9	2R3	Tone arm pivot stud	1
10	6R3	4-40 x 3/16" fil. hd. m. screw	1
11	RA50	Tone arm, pivot, stud, weight assembly R.C.A. tone arm	1
	RA51	Tone arm, pivot, stud, weight assembly E.V. tone arm	
	RA52	Tone arm, pivot, stud, weight assembly Shure tone arm	
12	4R6	Coil spring, counterbalance	1
13	8R1	RCA cartridge, sapphire needle	1
	8R4-2	Electro-Voice cartridge, sapphire needle	1
	8R4-3	Electro-Voice cartridge, sapphire needle (with ground lug)	1
	8R5-2	Shure Bros. cartridge, sapphire needle	1
	8R4-1	Electro-Voice cartridge, osmium needle	1
	8R5-1	Shure Bros. cartridge, osmium needle	1
14	6R4	2-56 x 3/16" flat hd. m. screw (RCA cartridge)	2
	6R13	4-40 x 5/32" slotted fil. hd. m. screw (Shure Bros. cartridge)	2
	6R16	4-40 x ⅛" slotted fil. hd. m. screw (Electro-Voice cartridge)	2
15	RA16	Tone arm support bracket and shaft assembly	1
16	5R18	Washer (tone arm) (thrust)	1
17	RA23	Motor board—RCA	1
	37	Motor board—Crescent	1
	RA36	Motor board—Crescent 1⅛" AC switch mounting bracket	1
18	3R10	Reject control knob	1
19	5R3	Washer	2
20	7R12	Ball thrust bearing	1
21	6R7	6-32 x 1¾" slotted fil. hd. screw	2
22	1R4	Turntable cam	1
23	6R6	4-40 x ¼" fil. hd. screw	2
23A	5R5	No. 4 split lock washer	2
24	2R1	Idler wheel stud	1
25	5R7	Washer (idler)	1
26	RA10	Idler wheel and bearing assembly	1
27	5R6	Washer (idler)	1
27A	1R23	Spring washer	1
28	7R2	6-32 hex nut	3
29	5R10	No. 6 flat washer	3
30	7R4	Rubber grommet	3
31	1R12	Idler wheel lever	1
31A	4R5	Coil spring (idler pulley plate)	1
32	RA12	Sub-base assembly	1
33	5R16	No. 8 flat washer	3
34	6R10	8-32 x ⅜" hex hd. screw	3
35	2R2	Motor spacer bushing	3
36	5R10	Washer	3
37	1R24	Deflection plate	1
38	5R5	No. 4 split lockwasher	1
39	7R1	4-40 hex nut	1
40	5R1	"C" washer	1
41	5R2	"C" washer	1
42	6R8	Bristol cup pt. set screw	2
43	3R7	Star wheel	1
44	5R2	"C" washer	1
45	RA8	Lever assembly	1
46	5R19	Washer	1
47	4R3	Coil spring (safety lever)	1
48	1R10	Mounting bracket (muting switch) } Assembly	1
49	7R13	Muting switch }	
50	5R15	No. 6 flat washer	1
51	6R2	No. 6 x 5/16" hex head screw self tapping	1
52	4R11	Coil spring (trip cushion spring)	1
53	RA3	Trip lever assembly	1
54	7R6	No. 8 square nut	1
55	5R14	No. 8 flat washer	1
56	6R5	8-32 x ¾" hex hd. m. screw	1
57	4R4	Coil spring (tone arm return)	1
58	5R4	"C" washer	1
59	4R8	Coil spring (tone arm recoil)	1
60	RA9	Lever assembly	1
61	6R10	6-32 x ⅜" hex head screw (see item 34 for quantity)	
62	5R16	No. 8 flat washer (see item 33 for quantity)	
63	1R13	Reject plate	1
64	1R18	Reject plate	1
65	4R2	Coil spring (reject assembly)	1
66	RA21	Set-down adjustment stud	1
67	4R2	Coil spring (reject assembly)	1
68	2R23	Height adjustment stud	1
69	5R4	"C" washer	1
70	RA5	Bushing and lever assembly	1
71	4R10	Coil spring (tone arm safety spring)	1
72	5R2	"C" washer	1
73	7R11	Speed nut	1
74	1R21	Reject coupling lever	1
75	5R2	"C" washer	1
76	RA6	Trip pawl assembly	1
77	RA7	Main lever assembly	1
78	4R1	Coil spring (main lever)	1
79	5R4	"C" washer	1
80	7R3	Motor 110-volt, 60-cycle	1
81	3R9	Tone arm rest	1
82	6R2	No. 6 self tapping screw	1
83	5R15	Flat washer	1
84	5R17	Spring lock washer	2

CROMWELL, PLYMOUTH, STARK
MODEL 1020



CROMWELL, PLYMOUTH, STARK
MODEL 1020

STARK MODEL 1020

TRADE NAME	Cromwell, Plymouth, Stark, Model 1020
MANUFACTURER	Stark Sound Engineering, 2131 Fairfield Ave., Fort Wayne 6, Indiana
SUPPLIERS	Cromwell-Mercantile Stores Co., Inc., 128 West 31st St., New York, New York
	Plymouth-Interstate Stores Suying Corp., 111 8th Ave., New York 11, New York
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES(FIVE)	Types 12BE6 Converter, 12BA6 IF Amp., 12AT6 DET-AVC-AF, 50C5 Power Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC RATING .25 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	540-1700KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointer turn tuning fully closed and set pointer even with the right end of the dial window. Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.02MFD	High side to stator of rear section of tuning gang. Low side to B-.	455KC (400 ~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1400KC	1400KC	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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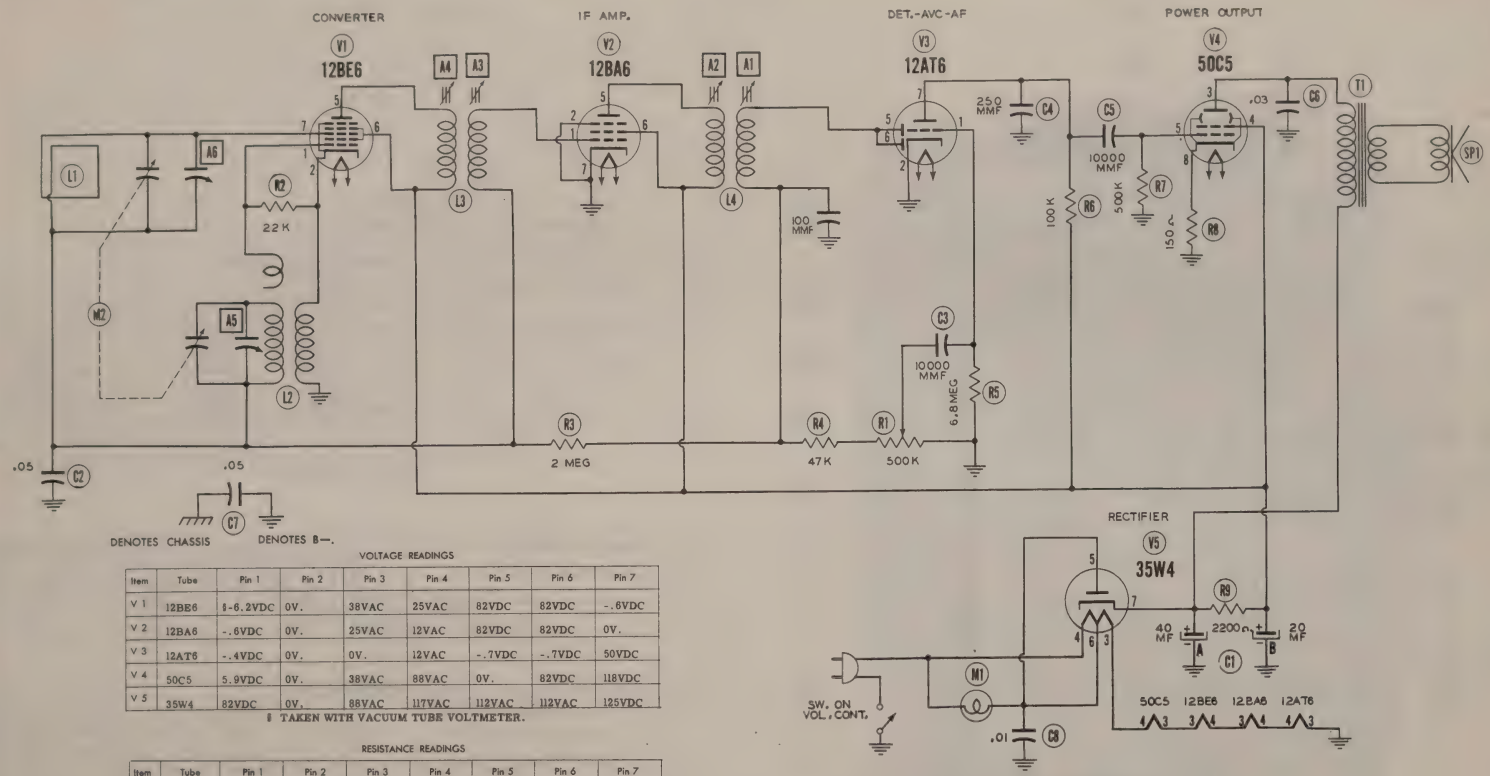

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	‡-6.2VDC	0V.	38VAC	25VAC	82VDC	82VDC	-.6VDC
V 2	12BA6	-.6VDC	0V.	25VAC	12VAC	82VDC	82VDC	0V.
V 3	12AT6	-.4VDC	0V.	0V.	12VAC	-.7VDC	-.7VDC	50VDC
V 4	50C5	5.9VDC	0V.	38VAC	88VAC	0V.	82VDC	118VDC
V 5	35W4	82VDC	0V.	88VAC	117VAC	112VAC	112VAC	125VDC

‡ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.5Ω	36Ω	24Ω	†2.2KΩ	†2.2KΩ	2.5 Meg.
V 2	12BA6	2.5 Meg.	0Ω	24Ω	12Ω	†2.2KΩ	†2.2KΩ	0Ω
V 3	12AT6	6.8 Meg.	0Ω	0Ω	12Ω	1.5 Meg.	1.5 Meg.	†100KΩ
V 4	50C5	150Ω	500KΩ	36Ω	85Ω	500KΩ	†2.2KΩ	†170Ω
V 5	35W4	130KΩ	Inf.	85Ω	110Ω	105Ω	105Ω	130KΩ

† MEASURED FROM PIN 7 OF V5.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

IF=455KC

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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89-5

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

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G-925, 925, 965

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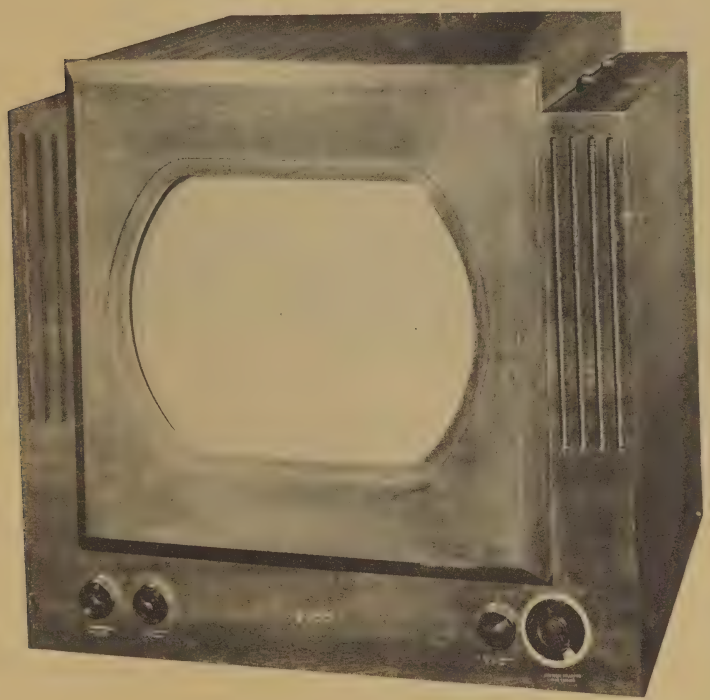

MODEL 925

FADA MODELS
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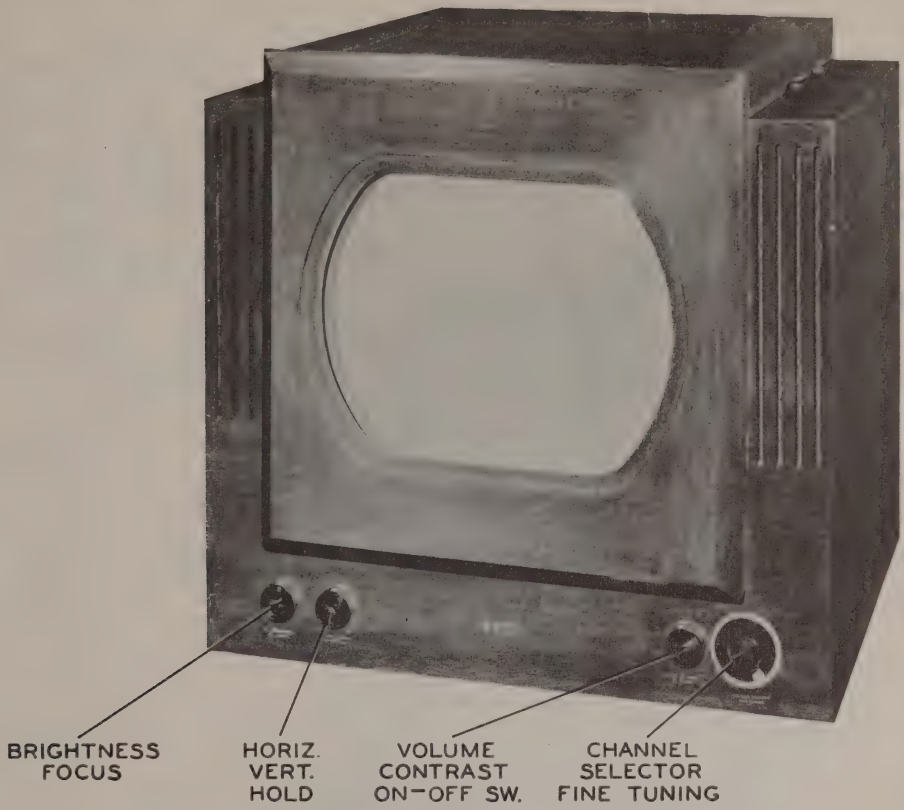
Date 3/50 Set No. 89—Folder No. 6



FADA MODELS
G-925, 925, 965

FADA MODEL 925

TRADE NAME	Fada Models G-925, 925, 965
MANUFACTURER	Fada Radio and Electric Co., Inc., 525 Main St., Belleville, New Jersey
TYPE SET	Television Receiver
TUBES	Thirty One
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	2.6 Amp. at 117 Volts AC
TUNING RANGE—	Channels 2 thru 13

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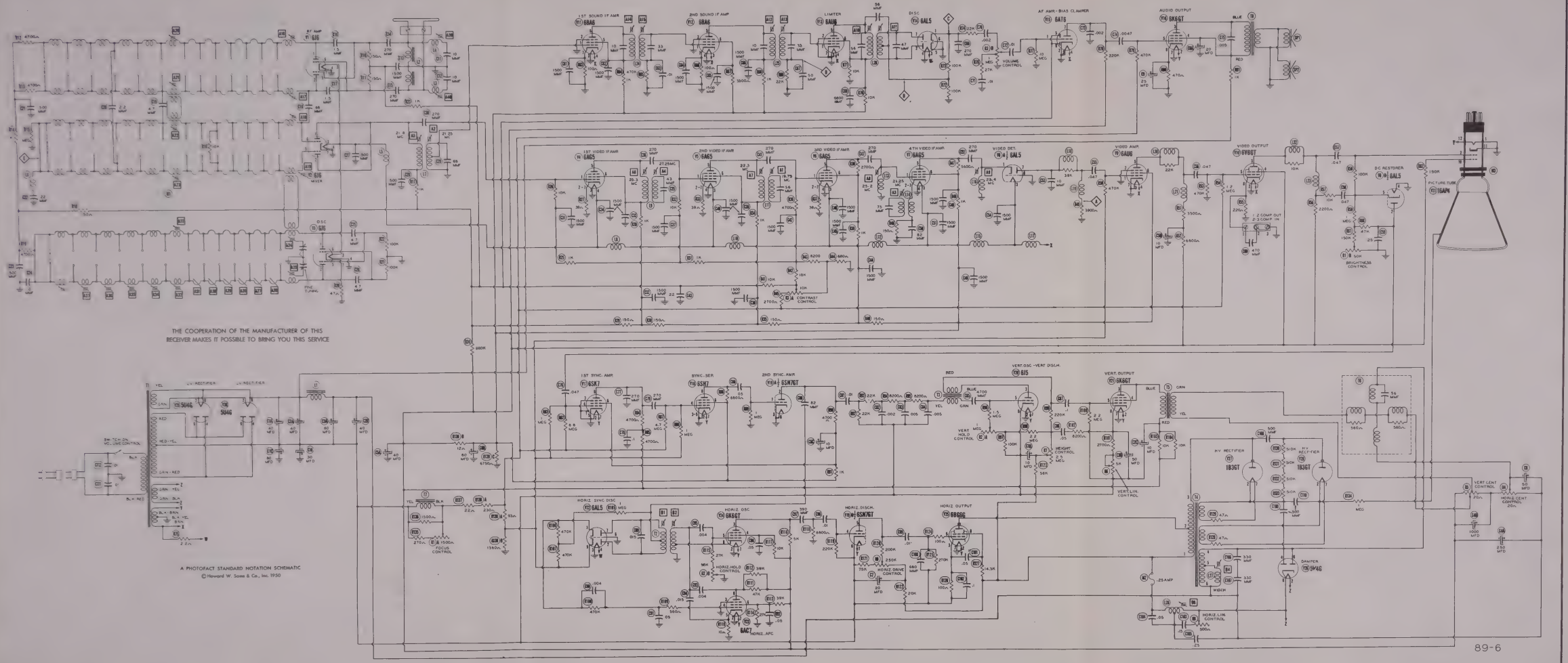
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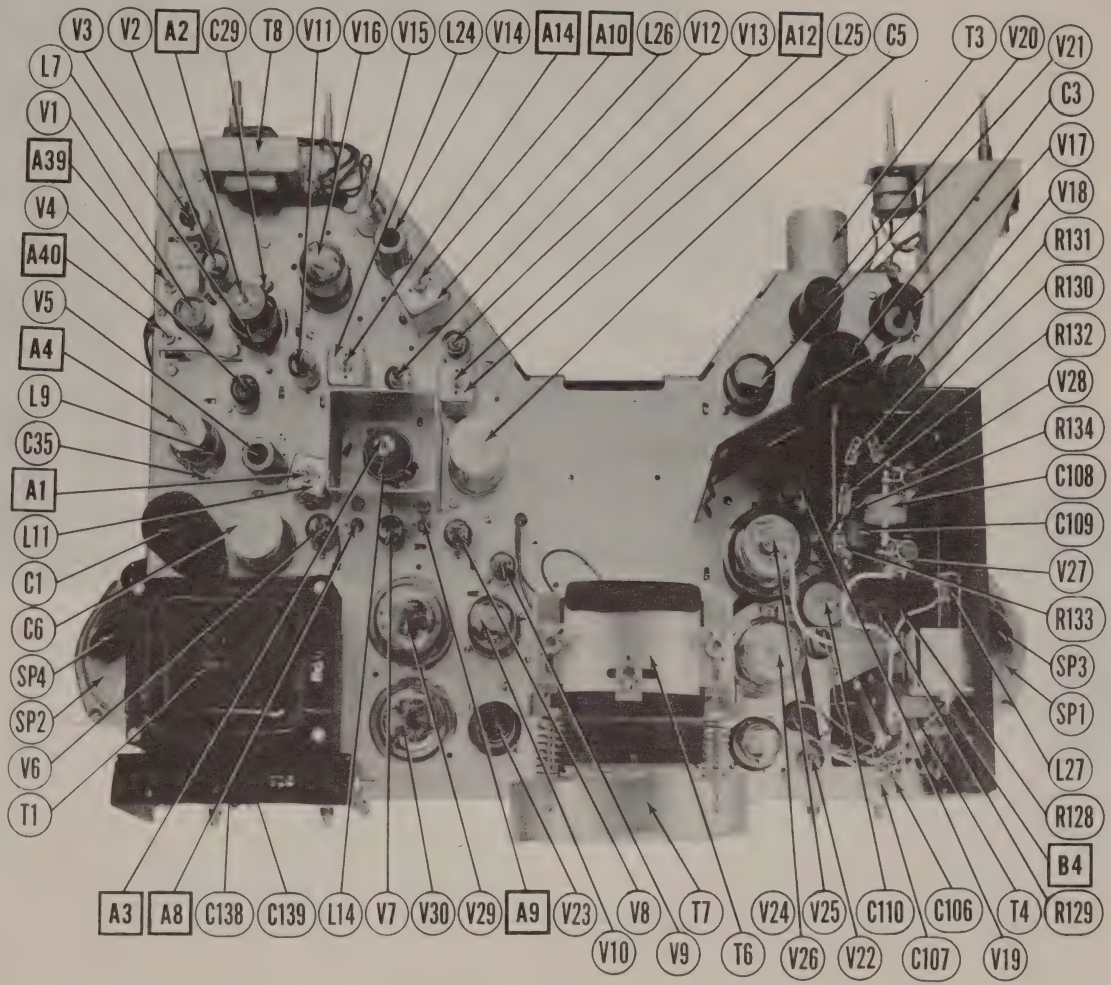
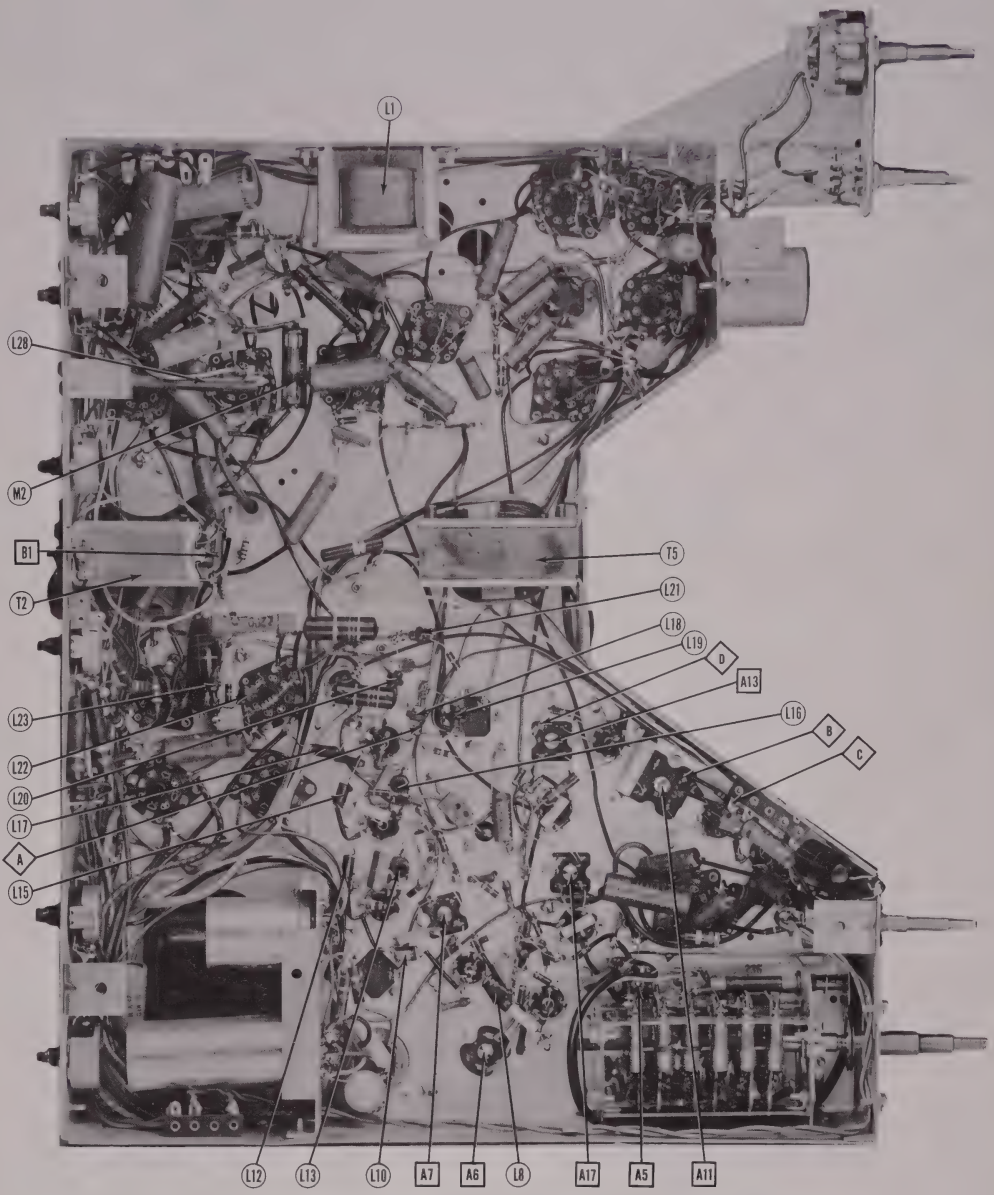
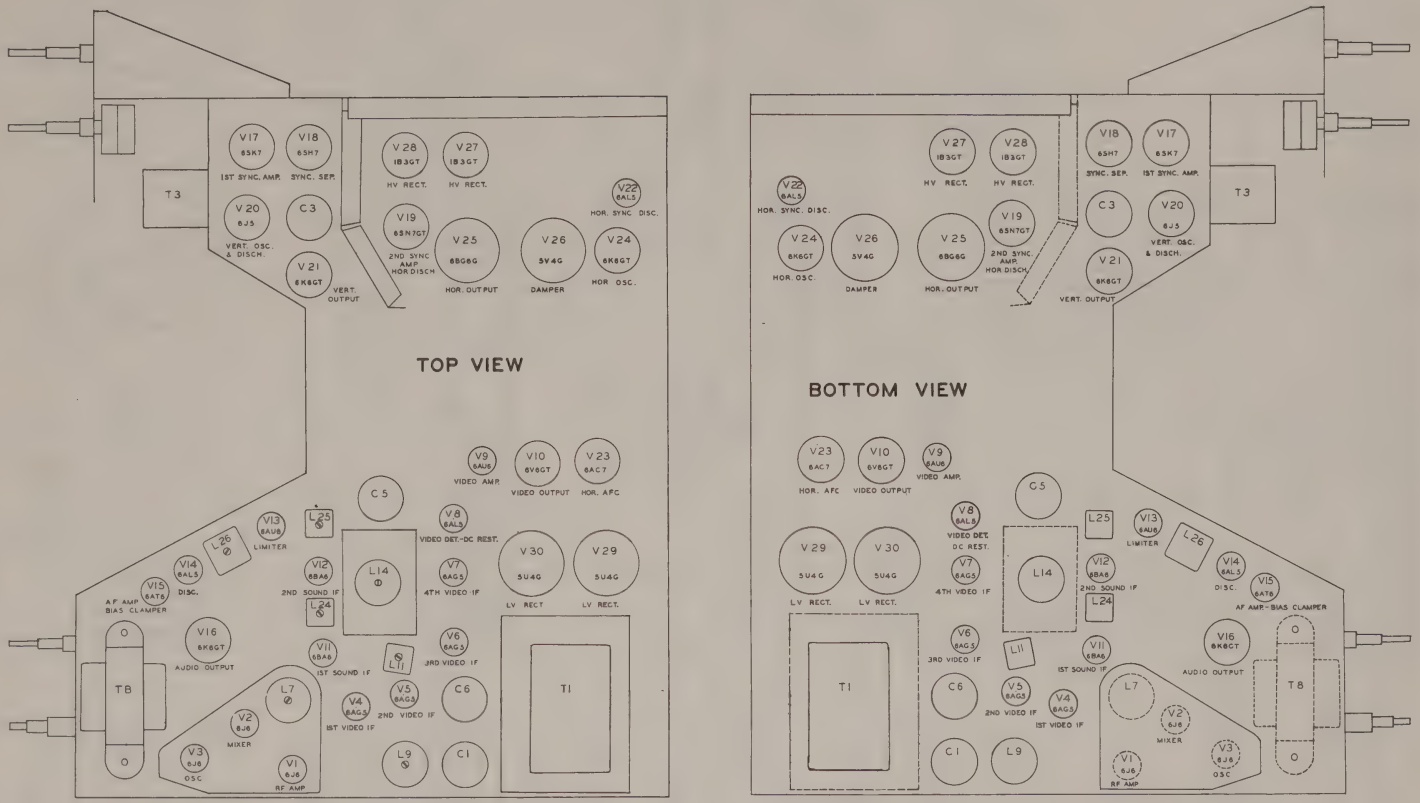


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If alignment is performed with picture tube removed, remove V24 from its socket to disable the high voltage supply.
The oscillator tube (V3) should be removed when performing IF adjustments. Use insulated alignment screwdriver for adjusting.

VIDEO IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.				9	DC Probe to junction of R42 and R43. Common to chassis.		Set contrast control to give a -3 volt reading. Leave at this setting during entire IF Alignment procedure.
2.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	19.75MC (Unmod.)	9	DC Probe to Point (A) Common to chassis.	A1	Adjust for MINIMUM deflection.
3.	Direct	"	21.25MC	9	"	A2	"
4.	Direct	"	21.25MC	9	"	A3	"
5.	Direct	"	27.25MC	9	"	A4	"
6.	Direct	"	21.8MC	9	"	A5	Adjust for maximum deflection.
7.	Direct	"	25.3MC	9	"	A6	"
8.	Direct	"	22.3MC	9	"	A7	"
9.	Direct	"	25.2MC	9	"	A8	"
10.	Direct	"	23.4MC	9	"	A9	Adjust for maximum deflection. If A7 required adjustment in step 8 repeat step 2. If sweep signal generator is not available continue with step 12.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal amplifier in the scope for horizontal deflection.
The waveforms shown may be inverted depending on the number of amplifying stages in the vertical amplifier in the scope being used.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Direct	High side to ungrounded tube shield floating over mixer tube V2. Low side to chassis.	24MC (10MC Sweep)	See Fig. 4	9	Vert. Amp. to Point (A) Ground to chassis.	A5, A6, A7, A8, A9	Check for response curve per Fig 4. Make slight adjustments if necessary for optimum response. If considerable adjustment is required the traps must be realigned.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Do not remove the shield covering the discriminator tube socket during step 12. Fashion hook on 1 Megohms resistor and make connection to Point B through alignment hole in shield.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	5000MMF	High side to pin 1 of 3rd Sound IF (V13). Low side to chassis.	21.25MC (Unmod.)	9	DC Probe to Point (B) in series with 1 Meg. Common to chassis.	A10	Detune A11. Adjust A10 for maximum deflection.
13.	5000MMF	"	"	9	DC Probe to Point (C) Common to chassis.	A11	Adjust for zero reading. A positive and negative reading is obtained on either side of the correct setting.
14.	5000MMF	High side to pin 1 of 2nd Sound IF (V12). Low side to chassis.	"	9	DC Probe to Point (D) Common to chassis.	A12, A13	Adjust for maximum deflection.
15.	5000MMF	High side to tap on trap winding of L7. Low side to chassis.	"	9	"	A14, A15	"

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	5000MMF	High side to pin 1 of 3rd Sound IF (V13). Low side to chassis.	21.25MC (600KC Sweep)	21.25MC	9	Vert. Amp. to Point (C) Low side to chassis.	A10, A11	Adjust A11 so marker occurs at the center of the diagonal line per Fig 1. Adjust A10 for maximum amplitude and straightness of diagonal line.
13.	5000MMF	High side to pin 1 of 2nd Sound IF (V12). Low side to chassis.	"	"	9	Vert. Amp. to Point (D) in series with 33KΩ Low side to chassis.	A12, A13	Adjust for maximum amplitude and symmetry as per Fig 2.
14.	5000MMF	High side to tap on trap winding of L7. Low side to chassis.	"	"	9	"	A14, A15	Adjust for maximum amplitude and symmetry as per Fig 3. Continue with step 16.

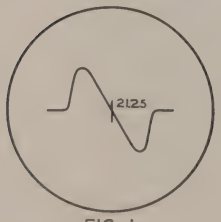


FIG. 1

FIG. 2

FIG. 3

FIG. 4

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

The signal generator output should be terminated with a resistance equal to its output impedance (usually 50 ohms). These adjustments are usually very stable and alignment should not be attempted unless they are known to be out of alignment.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	120Ω carbon res. in series with each lead.	To antenna terminals.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point E in series with 10KΩ. Low side to chassis.	A16, A17, A18, A19	Adjust for approximately flat top response per Fig 5 with markers above 70%.
17.	"	"	207MC (10MC SWP)	205.25MC 209.75MC	12	"		Check for response curve per Fig 5.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			

If markers are below 70% on any channel make slight adjustment of A16, A17, A18 and A19 with channel selector on that channel. Recheck the other high band channels.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
18.	120Ω carbon res. in series with each lead.	To antenna terminals.	85MC (10MC SWP)	83.25MC 87.75MC	6	Vert. Amp. to Point E in series with 10KΩ. Low side to chassis.	A20, A21, A22, A23	Adjust for approximately flat top response per Fig 5 with markers above 70%.
19.	"	"	79MC (10MC SWP)	77.25MC 81.75MC	5	"		Check for response curve per Fig 5.
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

If markers are below 70% on any channel make slight adjustments of A20, A21, A22 and A23 with channel selector on that channel. Recheck the other low band channels.

OSCILLATOR ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
20.	Two 120Ω carbon res.	To antenna terminals.	215.75MC (Unmod.)	13	DC Probe to Point C Common to chassis.	A24, A25	Adjust for zero reading. A positive and negative reading is obtained on either side of the correct setting. Keep A24 and A25 slugs at approximately the same relative setting.
21.	"	"	209.75MC	12	"	A26	Adjust for zero reading as above.
			203.75MC	11		A27	
			197.75MC	10		A28	
			191.75MC	9		A29	
			185.75MC	8		A30	
			179.75MC	7		A31	
22.	"	"	87.75MC	6	"	A32, A33	Adjust for zero reading keeping A32 and A33 slugs at approximately the same relative position.
23.	"	"	81.75MC	5	"	A34	Adjust for zero reading.
			71.75MC	4		A35	
			65.75MC	3		A36	
			59.75MC	2		A37	

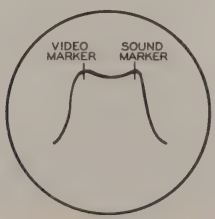
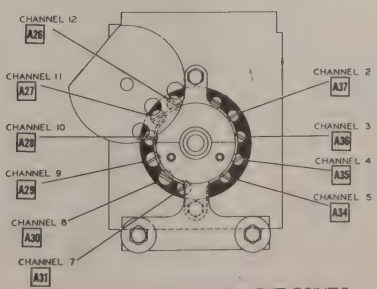


FIG. 5



RF OSCILLATOR ALIGNMENT POINTS

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	110VDC	110VDC	6.3VAC	0V.	.8VDC	.7VDC	0V.		
V 2	6J6	90VDC	90VDC	6.3VAC	0V.	1VDC	2.5VDC	0V.		
V 3	6J6	70VDC	70VDC	6.3VAC	0V.	§-1.6VDC	§-1.4VDC	.3VDC		
V 4	6AG5	-1VDC	.2VDC	0V.	6.3VAC	90VDC	90VDC	.2VDC		
V 5	6AG5	-1VDC	.2VDC	6.3VAC	0V.	95VDC	95VDC	.2VDC		
V 6	6AG5	-1.1VDC	.3VDC	6.3VAC	0V.	85VDC	100VDC	.3VDC		
V 7	6AG5	0V.	1VDC	6.3VAC	0V.	70VDC	105VDC	1VDC		
V 8	6AL5	0V.	-95VDC	6.3VAC	0V.	-80VDC	0V.	-5.1VDC		
V 9	6AU6	-1.5VDC	0V.	0V.	6.3VAC	240VDC	110VDC	0V.		
V 10	6V6GT	0V.	0V.	150VDC	260VDC	-2.1VDC	0V.	6.3VAC	8.5VDC	
V 11	6BA6	0V.	0V.	0V.	6.3VAC	95VDC	95VDC	1.4VDC		
V 12	6BA6	0V.	0V.	6.3VAC	0V.	100VDC	100VDC	1.4VDC		
V 13	6AU6	-.3VDC	0V.	0V.	6.3VAC	42VDC	42VDC	0V.		
V 14	6AL5	0V.	-.4VDC	5.3VAC	0V.	0V.	0V.	-.3VDC		
V 15	6AT6	-.4VDC	0V.	0V.	6.3VAC	.1VDC	.1VDC	82VDC		
V 16	6K6GT	0V.	6.3VAC	230VDC	245VDC	0V.	82VDC	0V.	15VDC	
V 17	6SK7	0V.	0V.	0V.	-.9VDC	0V.	100VDC	6.3VAC	190VDC	
V 18	6SH7	0V.	0V.	0V.	-1.2VDC	0V.	110VDC	6.3VAC	120VDC	
V 19	6SN7GT	0V.	70VDC	0V.	#-32VDC	#8VDC #85VDC	#0V.	6.3VAC	0V.	
V 20	6J5	0V.	0V.	#87VDC ♦325VDC	#0V.	#-9.3VDC	#-3.2VDC	6.3VAC	#0V.	
V 21	6K6GT	0V.	6.3VAC	#340VDC	#340VDC	#0V.	#30VDC #.6VDC	0V.	#45VDC #32VDC	
V 22	6AL5	-.6VDC	-3VDC	0V.	5.3VAC	-2.5VDC	0V.	-4.7VDC		
V 23	6AC7	0V.	0V.	0V.	-.7 VDC	0V.	100VDC	6.3VAC	210VDC	
V 24	6K6GT	0V.	0V.	175VDC	195VDC	-27VDC	310VDC	6.3VAC	.2VDC	
V 25	6BG6G	0V.	6.3VAC	#13VDC	0V.	0V.	0V.	0V.	300VDC	TOP CAP *
V 26	5V4G	0V.	315VDC	0V.	270VDC	0V.	270VDC	0V.	315VDC	
V 27	1B3GT	* DO NOT MEASURE								
V 28	1B3GT	* DO NOT MEASURE								
V 29	5U4G	0V.	280VDC	0V.	360VAC	0V.	360VAC	0V.	280VDC	
V 30	5U4G	0V.	280VDC	0V.	360VAC	0V.	360VAC	0V.	280VDC	
V31	16AP4	0V.	-80VDC	PIN 10 260VDC	PIN 11 0V.	PIN 12 6.3VAC				

RESISTANCE READINGS

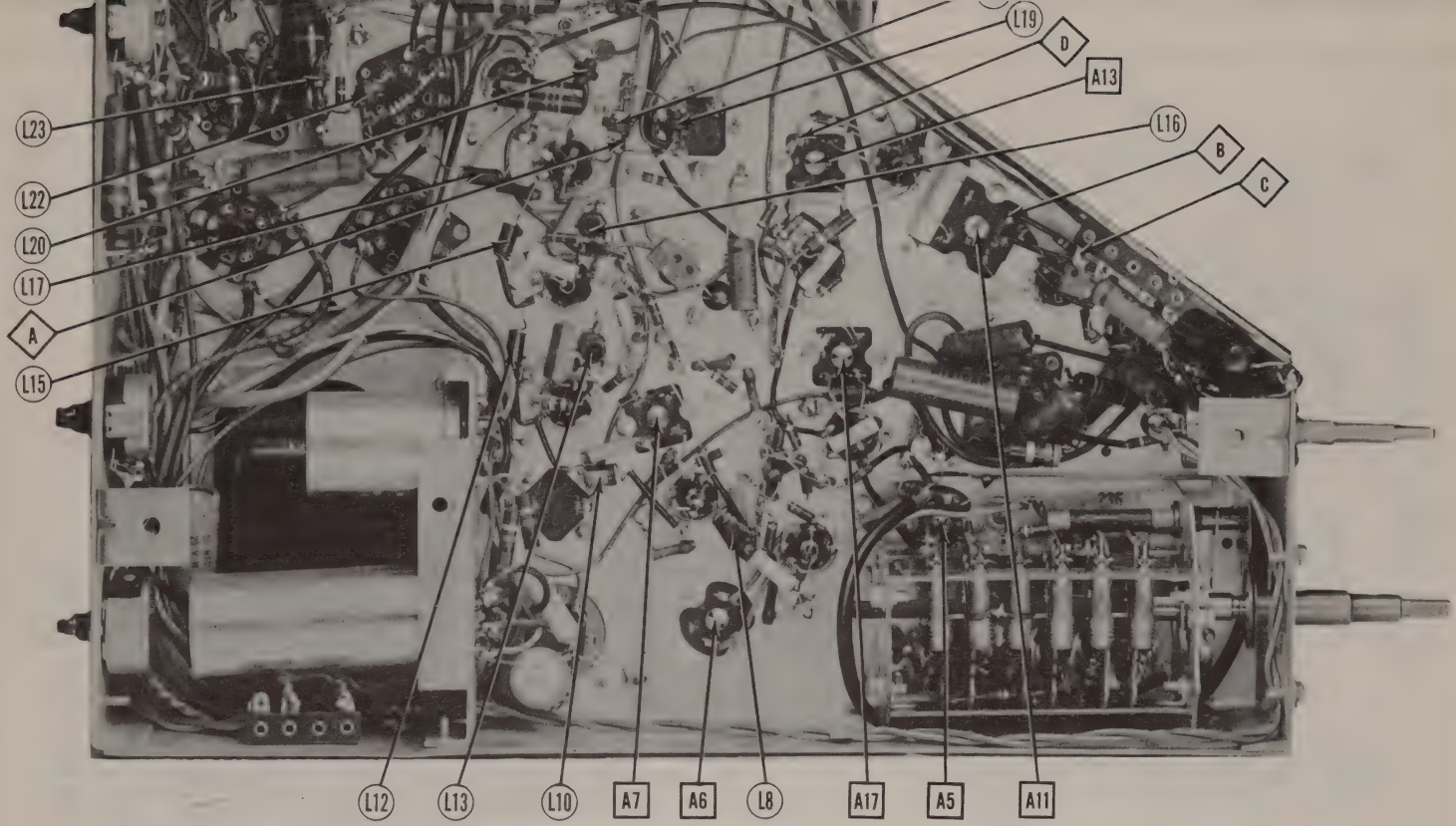
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	†5.5KΩ	†5.5KΩ	.1Ω	0Ω	13KΩ	13KΩ	0Ω		
V 2	6J6	†3KΩ	†3KΩ	.1Ω	0Ω	1 Meg.	1 Meg.	0Ω		
V 3	6J6	†6.5KΩ	†6.5KΩ	.1Ω	0Ω	100KΩ	100KΩ	47Ω		
V 4	6AG5	18KΩ	39Ω	0Ω	.1Ω	†2.8KΩ	†2.8KΩ	39Ω		
V 5	6AG5	18KΩ	39Ω	.1Ω	0Ω	†2.6KΩ	†2.6KΩ	39Ω		
V 6	6AG5	11KΩ	39Ω	.1Ω	0Ω	†5KΩ	†2.4KΩ	39Ω		
V 7	6AG5	.1Ω	150Ω	.1Ω	0Ω	†8KΩ	†2.4KΩ	150Ω		
V 8	6AL5	.1Ω	200KΩ	.1Ω	0Ω	1.1 Meg.	0Ω	4KΩ		
V 9	6AU6	470KΩ	0Ω	0Ω	.1Ω	†10KΩ	†1.3KΩ	0Ω		
V 10	6V6GT	0Ω	0Ω	†2.5KΩ	†74Ω	330KΩ	Inf.	.1Ω	220Ω	
V 11	6BA6	.1Ω	0Ω	0Ω	.1Ω	†2.3KΩ	†2.3KΩ	100Ω		
V 12	6BA6	470KΩ	0Ω	.1Ω	0Ω	†2.3KΩ	†4.5KΩ	100Ω		
V 13	6AU6	22KΩ	0Ω	0Ω	.1Ω	†7KΩ	†7KΩ	0Ω		
V 14	6AL5	200KΩ	100KΩ	1.5Ω	0Ω	0Ω	0Ω	100KΩ		
V 15	6AT6	10 Meg.	0Ω	0Ω	.1Ω	12KΩ	12KΩ	†220KΩ		
V 16	6K6GT	Inf.	.1Ω	†1.5KΩ	†1000Ω	470KΩ	†220KΩ	0Ω	470Ω	
V 17	6SK7	0Ω	0Ω	0Ω	850KΩ	0Ω	†2.3KΩ	.1Ω	†9.5KΩ	
V 18	6SH7	0Ω	0Ω	0Ω	1 Meg.	0Ω	†1.3KΩ	.1Ω	†8KΩ	
V 19	6SN7GT	1 Meg.	†7KΩ	0Ω	#220KΩ	#400KΩ #300KΩ	#0Ω	.1Ω	0Ω	
V 20	6J5	0Ω	0Ω	♦1.5 Meg. ♦270KΩ	#60KΩ	#2.5 Meg.	#1 Meg.	.1Ω	#0Ω	
V 21	6K6GT	Inf.	.1Ω	†5.5KΩ	†5.5KΩ	#2.2 Meg.	#5KΩ #50Ω	0Ω	#8KΩ #2.7KΩ	
V 22	6AL5	1 Meg.	1.5 Meg.	0Ω	1.5Ω	12Ω	0Ω	1.5 Meg.		
V 23	6AC7	0Ω	0Ω	0Ω	1.5 Meg.	10Ω	†17KΩ	.1Ω	†20KΩ	
V 24	6K6GT	Inf.	0Ω	†5KΩ	†10KΩ	70KΩ	♦12Ω	.1Ω	10Ω	
V 25	6BG6G	Inf.	.1Ω	#100Ω	Inf.	#270KΩ	#270KΩ	0Ω	♦14KΩ	TOP CAP ♦90Ω
V 26	5V4G	Inf.	130KΩ	Inf.	†45Ω	Inf.	†45Ω	Inf.	130KΩ	
V 27	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ♦140Ω
V 28	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ♦ Inf.
V 29	5U4G	Inf.	6KΩ	Inf.	¶13.5Ω	Inf.	¶12.5Ω	Inf.	6KΩ	
V 30	5U4G	Inf.	6KΩ	Inf.	¶13.5Ω	Inf.	¶12.5Ω	Inf.	6KΩ	
V31	16AP4	0Ω	1.3 Meg.	PIN 10 †150KΩ	PIN 11 0Ω	PIN 12 .1Ω				

MEASURED FROM PIN 6 OF V19.
* DO NOT MEASURE.

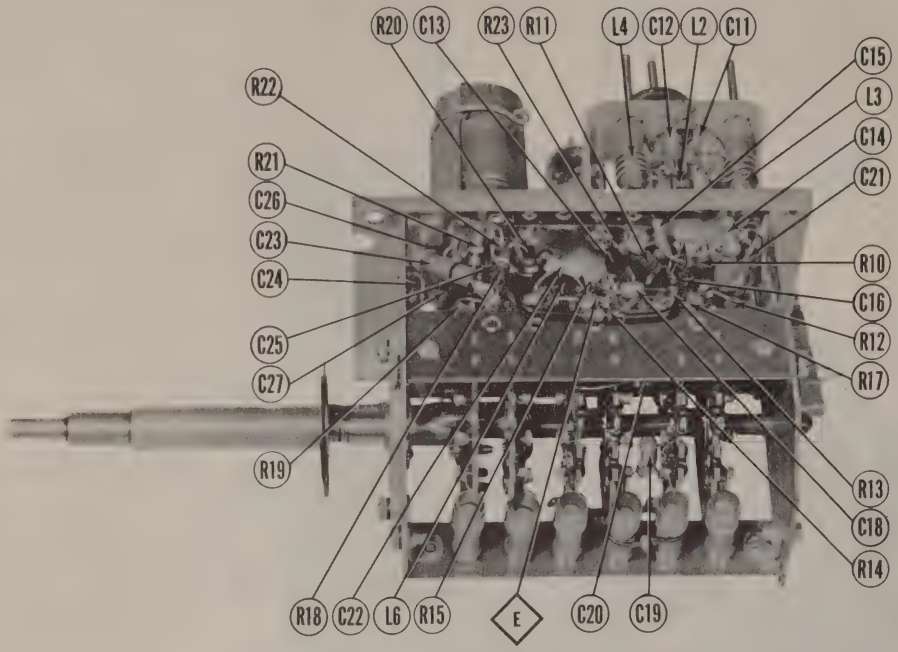
NOTE: CONTRAST CONTROL SET AT MAXIMUM FOR THESE MEASUREMENTS.

† MEASURED FROM PIN 8 OF V29.
# MEASURED FROM PIN 6 OF V19.
♦ MEASURED FROM PIN 8 OF V26.
¶ MEASURED FROM CENTER - TAP OF T1.

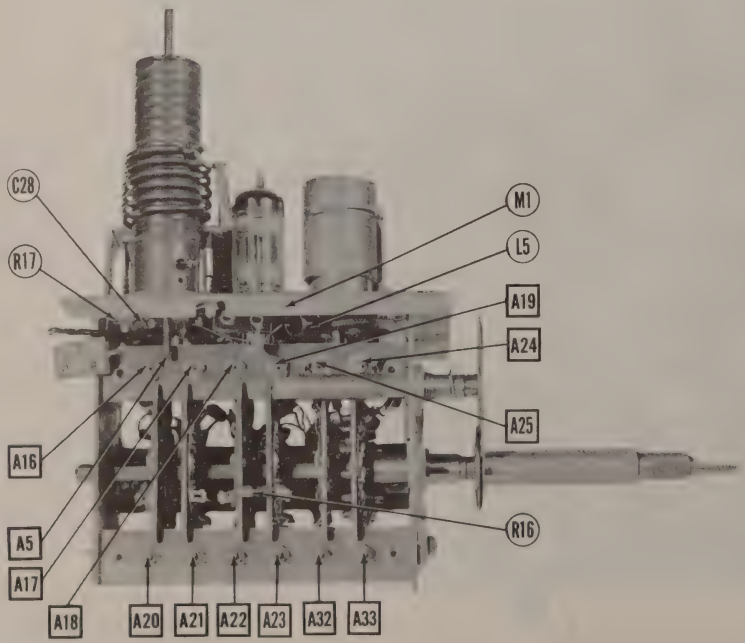
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

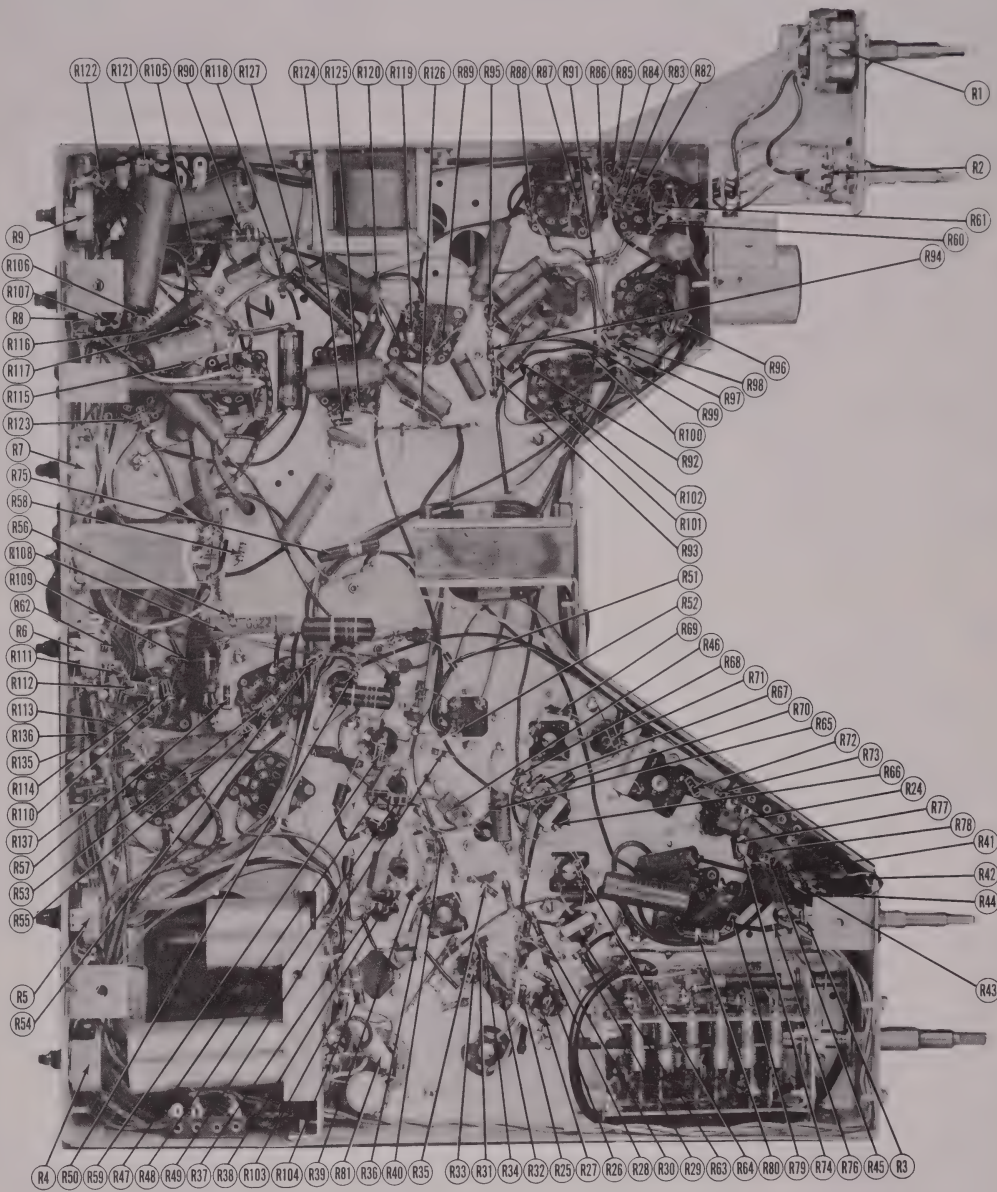


RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		FADA PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6J6	6J6	7BF	
V2	Mixer	6J6	6J6	7BF	
V3	Oscillator	6J6	6J6	7BF	
V4	1st Video IF	6AG5	6AG5	7BD	
V5	2nd Video IF	6AG5	6AG5	7BD	
V6	3rd Video IF	6AG5	6AG5	7BD	
V7	4th Video IF	6AG5	6AG5	7BD	
V8	Video Det. -DC Restorer	6AL5	6AL5	6BT	
V9	Video Amp.	6AU6	6AU6	7BK	
V10	Video Output	6V6GT	6V6GT	7AC	
V11	1st Sound IF	6BA6	6BA6	7BK	
V12	2nd Sound IF	6BA6	6BA6	7BK	
V13	Limiter	6AU6	6AU6	7BK	
V14	Disc.	6AL5	6AL5	6BT	
V15	AF Amp. -Bias Clamper	6AT6	6AT6	7BT	
V16	Audio Output	6K6GT	6K6GT	7S	
V17	1st Sync. Amp.	6SK7	6SK7	8N	
V18	Sync. Sep.	6SH7	6SH7	8BK	
V19	2nd Sync. Amp. - Hor. Disch.	6SN7GT	6SN7GT	8BD	
V20	Vert. Osc. - & Disch.	6J5	6J5	6Q	
V21	Vert. Output	6K6GT	6K6GT	7S	
V22	Hor. Sync. Disc.	6AL5	6AL5	6BT	
V23	Hor. AFC	6AC7	6AC7	8N	
V24	Hor. Osc.	6K6GT	6K6GT	7S	
V25	Hor. Output	6BG6G	6BG6G	5BT	
V26	Damper	5V4G	5V4G	5L	
V27	HV Rectifier	1B3GT	1B3GT	3C	
V28	HV Rectifier	1B3GT	1B3GT	3C	
V29	LV Rectifier	5U4G	5U4G	5T	
V30	LV Rectifier	5U4G	5U4G	5T	
V31A	Picture Tube	16AP4	16AP4	12D	Model 925, 965
B	Picture Tube	15AP4	15AP4	12G	Model G-925

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	FADA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	450	22.22	AFH82J16E	UP9CJ915		TVL-25	▬ Filter
B	10	450						■ Vert. Osc. Plate Dec.
C	80	150						▲ Filter
C2A	40	450	22.23	AFH882J	UP9CJ897		TVL-30	▬ Filter
B	40	450						■ Filter
C	10	450						▲ Vert. Output Plate Decoup.
C3A	80	450	22.24	AFH16J10B	UP9BJ730		TVL-18	▬ Filter
B	50	50						▲ Vert. Output Cath. Bypass
C4A	250	10	22.27	PRS10/250	UP7BJ808		TVL-66	▬ Hor. Cent. Cont. Bypass
B	1000	6		PRS6/1000				▲ Vert. Cent. Cont. Bypass
C5A	40	450	22.25	AFH82J2H	UP9CJ731		TVL-53	▬ Filter
B	10	450						■ Low Pass Filter
C	10	350						▲ Decoupling
C6A	20	450	22.26	AFH4J16H	UP9BJ337		TVL-16	▬ Output Decoupling
B	80	350						▲ Filter
C7	20	500	22.62	PRS500/16	BR2050A		UT-205	Hor. Discharge Dec.
C8	50	25	22.61	PRS25/50	BR502A		TVA-7	Hor. Sweep Coupling
C9	25	25	22.31	PRS25/25	BR252A		TVA-6	Output Cathode Bypass
C10	30	150		PRS150/30	BR3015A		TVA-18	Filter †
C11	10			CN10J10		NPOK-10		Fixed Trimmer
C12	10			CN10J10		NPOK-10		Fixed Trimmer
C13	1500			GP1500M		GP2L-0015		Bias Filter
C14	270			GP270M		GP2K-270		RF Coupling
C15	270			GP270M		GP2K-270		RF Coupling
C16	1.5					NPOK-1.5		Neutralizing
C17	1.5					NPOK-1.5		Neutralizing
C18	.68							RF Coupling
C19	4.7			CN4.7CNPO		NPOK-4.7		RF Coupling
C20	2.2							RF Coupling
C21	1500			GP1500M		GP2L-0015		RF Decoupling
C22	22			CN22JN750		N750K-22		Fixed Trimmer
C23	1500			GP1500M		GP2L-0015		Osc. Decoupling
C24	10			CN10JNPO		NPOK-10		Fixed Trimmer
C25	4.7			CN4.7CNPO		NPOK-4.7		Osc. Feedback
C26	4.7			CN4.7CNPO		NPOK-4.7		Osc. Feedback
C27	1500			GP1500M		GP2L-0015		Filament Bypass
C28	1500			GP1500M		GP2L-0015		Mixer Decoupling
C29	68	300						Fixed Trimmer
C30	270	500	17.9	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C31	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	Bias Filter
C32	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	RF Bypass
C33	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	1st V. IF Decoupling
C34	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	1st V. IF Fil. Bypass
C35	43							Fixed Trimmer
C36	270	500	17.9	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C37	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	Bias Filter
C38	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	RF Bypass
C39	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	2nd V. IF Decoupling
C40	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	2nd V. IF Fil. Bypass
C41	270	500	17.9	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C42	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	Bias Filter
C43	.22	400	12.61	P488-22	GT4P25		TC-2	Bias Filter
C44	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	RF Bypass
C45	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	3rd V. IF Decoupling
C46	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	3rd V. IF Fil. Bypass
C47	270	500	17.9	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA FADA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C48	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	RF Bypass
C49	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	4th V. IF Decoupling
C50	82	500	17.37	1468-0001	5W5T1	GP1K-100	1FM-31	4th V. IF Cath. Bypass
C51	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	4th V. IF Fi.. Bypass
C52	270	500	17.9	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C53	10		17.33	GP10K	5W5Q1	GP1K-10	MS-41	V. Diode Filter
C54	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	V. Det. Fil. Bypass
C55	.047	400	12.12	P488-047	PTE4S5		TM-15	Video Coupling
C56	.047	600	12.38	P688-047	PTE6S5		TM-15	Video Coupling
C57	.047	600	12.38	P688-047	PTE6S5		TM-15	Video Coupling
C58	.047	600	12.38	P688-047	PTE6S5		TM-15	Video Coupling
C59	.25	400	12.17	P488-25	GT4P25		TC-2	DC Res. Decoupling
C60	470	500	17.96	1468-0005	5W5T5	GP2K-470	1FM-35	Video Compensation
C61	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	1st S. IF Cath. Bypass
C62	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	1st S. IF Decoupling
C63	.01	400	12.6	P488-01	PTE4S1	GP2-335-01	TM-11	2nd S. IF Grid Filter
C64	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	2nd S. IF Cath. Bypass
C65	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	2nd S. IF Screen Bypass
C66	1500		17.45	GP1500M	1W5D15	GP2L-0015	1FM-215	2nd S. IF Plate Decoupling
C67	50		17.18	GP50M	5W5Q5	GP1K-50	1FM-45	Limiter Grid Filter
C68	6800		17.35	GP6800M	1D3D7	GP2M-0068	1FM-27	Limiter Decoupling
C69	270	500	17.9	1468-00025	5W5T25	GP2K-500	1FM-325	RF Bypass
C70	.002	600	12.2	P688-002	PTE6D2	GP2M-002	TM-22	Audio Coupling
C71	.01	400	12.6	P488-01	PTE4S1	GP2-335-01	TM-11	Tone Compensation
C72	.01	400	12.6	P488-01	PTE4S1	GP2-335-01	TM-11	Audio Coupling
C73	.002	600	12.2	P688-002	PTE6D2	GP2M-002	TM-22	De-emphasis
C74	.0047	400	12.7	P688-005	PTE6D5	GP2M-0047	TM-25	Audio Coupling †
C75	.005	600	12.19	P688-005	PTE6D5	GP2M-0047	TM-25	Output Plate Bypass
C76	.047	400	12.12	P488-05	PTE4S5		TM-15	Sync. Coupling
C77	270	500	17.9	1468-00025	5W5T25	GP2K-270	1FM-325	1st Sync. Amp. Plate Bypass
C78	.1	400	12.15	P488-1	PTE4P1		TM-1	1st Sync. Amp. Plate Decoupling
C79	270	500	17.9	1468-00025	5W5T25	GP2K-270	1FM-325	Sync. Coupling
C80	.05	400	12.12	P488-05	PTE4S5		TM-15	Sync. Coupling
C81	.01	400	12.6	P488-01	PTE4S1	GP2-335-01	TM-11	Vert. Sync. Coupling
C82	.002	600	12.2	P688-002	PTE6D2	GP2M-002	TM-22	Integrator Net.
C83	.005	600	12.7	P688-005	PTE6D5	GP2M-005	TM-25	Integrator Net:
C84	.005	600	12.7	P688-005	PTE6D5	GP2M-005	TM-25	Integrator Net.
C85	4700	500	17.40	1467-005	1D5D5	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C86	.05	600	12.38	P688-05	PTE6S5		TM-15	Vert. Discharge
C87	.1	400	12.15	P488-1	PTE4P1		TM-1	Vert. Sweep Coupling
C88	82	500	17.37					Hor. Sync. Coupling
C89	.015	400	12.36	P488-015	PTE6S15			Fixed Trimmer
C90	.004	400	12.35	P688-004	PTE6D4		TM-24	AFC Filter
C91	.05	400	12.12	P488-05	PTE4S5		TM-15	AFC Filter
C92	.05	600	12.38	P688-05	PTE6S5		TM-15	Hor. AFC Screen Bypass
C93	.004	600	12.35	P688-004	PTE6D4		TM-24	AFC Filter
C94	.015	400	12.36	P488-015	PTE6S15			Phase Shifter
C95	.004	400	12.35	P688-004	PTE6D4		TM-24	Hor. Osc. Grid Cap.
C96	.05	600	12.38	P688-05	PTE6S5		TM-15	Hor. Osc. Screen Bypass
C97	390	500	17.38	1468-0004	5W5T4	GP2K-390	1FM-34	Differentiator Net.
C98	.01	400	12.6	P488-01	PTE4S1	GP2-335-01	TM-11	Hor. Sweep Coupling
C99	.01	600	12.7	P688-01	PTE6S1	GP2-335-01	TM-11	Hor. Sweep Coupling
C100	680	500	17.39		1W5T7	GP2K-680	1FM-37	Hor. Discharge
C101	.05	600	12.38	P688-05	PTE6S5		TM-15	Hor. Output Screen Bypass
C102	.1	200	12.14	P288-1	PTE4P1		TM-1	Hor. Output Cath. Bypass
C103	.15	200	12.27	P288-15				Damper Filter
C104	.05	400	12.12	P488-05	PTE4S5		TM-15	Damper Filter
C105	.25	600	12.61	684-25	GT6P25		TC-2	Damper Filter
C106	330	500	17.97			GP2K-330		Fixed Trimmer *
C107	330	500	17.97			GP2K-330		Fixed Trimmer *
C108	500	15000	17.95			410-500		Voltage Doubler Cap.
C109	500	15000	17.41					HV Filter
C110	500	15000	17.95			410-500		HV Filter
C111	.01	400	12.22	P488-01	PTE4S1	GP2-335-01	TM-11	Line Filter
C112	.01	400	12.22	P488-01	PTE4S1	GP2-335-01	TM-11	Line Filter

† Not used in all models.
* Some models use 220MMF in this application.
‡ Some models use .01MFD in this application.

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	REPLACEMENT DATA FADA PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1500Ω	4	52.49		52.49	Focus control, Wire Wound
B	50KΩ					Brightness control
R2A	1 Meg.			B11-137 *		Vert. hold control, front
B	50KΩ		52.21	B11-123 *	52.21	Horiz. hold control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
R3A	10KΩ			B17-116 *	52.22	Contrast control, front
B	1 Meg.		52.22	B13-137X *		Volume control, tapped at 200KΩ, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
D	Switch			76-1 *		Attach per instructions in "Concentrikit".
R4	20Ω	2	52.52	W-20	43-20	Horiz. centering control, Wire Wound
R5	20Ω	2	52.26	W-20x10	43-20CT	Vert. centering control, tapped at 10Ω
R6	5000Ω		52.25	Q11-114	M-19-S	Vert. linearity control
R7	2.5 Meg.		52.24	Q11-239	M-84-S	Height control
R8	500Ω	2	52.55	W-500	43-500	Horiz. linearity control, Wire Wound
R9	250KΩ		52.38	Q11-130	M-52-S	Horiz. drive control

* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FADA PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R10	150Ω				RF Grid
R11	150Ω				RF Grid
R12	4700Ω 20%			BTS-4700	RF Plate
R13	4700Ω 20%			BTS-4700	RF Plate

RESISTOR

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FADA PART No.	IRC PART No.
R14	1000Ω 20%			BTS-1000
R15	1 Meg. 20%			
R16	10KΩ			
R17	1000Ω 20%			BTS-1000
R18	150Ω			
R19	4700Ω 20%			BTS-4700
R20	47Ω 20%			
R21	100KΩ 20%			BTS-100K
R22	100KΩ 20%			BTS-100K
R23	1000Ω			BTS-1000
R24	680KΩ 5%		32.93	BTS-680K-5%
R25	1000Ω		32.8	BTS-1000
R26	10KΩ 5%		32.80	
R27	39Ω		32.64	
R28	1000Ω		32.8	BTS-1000
R29	150Ω		32.4	
R30	150Ω		32.4	
R31	1000Ω		32.8	BTS-1000
R32	10KΩ 5%		32.80	
R33	39Ω		32.64	
R34	1000Ω		32.8	BTS-1000
R35	150Ω		32.4	
R36	4700Ω 5%		32.75	
R37	39Ω		32.64	
R38	2700Ω		32.57	BTS-2700
R39	1000Ω		32.8	BTS-1000
R40	150Ω		32.4	
R41	10KΩ		32.11	BTS-10K
R42	18KΩ		32.81	BTS-18K
R43	8200Ω		32.77	BTS-8200
R44	680Ω		32.31	BTS-680
R45	2700Ω		32.57	BTS-2700
R46	150Ω		32.4	
R47	5600Ω 5%		32.76	
R48	1000Ω		32.8	BTS-1000
R49	3900Ω 5%		32.73	BTS-3900-5%
R50	470KΩ		32.92	BTS-470K
R51	3300Ω		32.32	BTS-3300
R52	6800Ω		32.10	BTS-6800
R53	470KΩ		32.92	BTS-470K
R54	1.2 Meg. 5%		32.96	BTS-1.2 Meg.
R55	220Ω		32.5	
R56	2200Ω	10	117.41	AB-2250
R57	10KΩ		32.11	BTS-10K
R58	100KΩ		32.89	BTS-100K
R59	1 Meg.		32.33	BTS-1 Meg.
R60	47KΩ		32.15	BTS-47K
R61	150KΩ		32.90	BTS-150K
R62	150KΩ		32.90	BTS-150K
R63	100Ω		32.2	
R64	1000Ω		32.8	BTS-1000
R65	470KΩ		32.92	
R66	100Ω		32.2	
R67	3300Ω		32.32	BTS-3300
R68	1000Ω		32.8	BTS-1000
R69	22KΩ		32.13	
R70	10KΩ	1	32.79	
R71	10KΩ		32.11	BTS-10K
R72	100KΩ		32.89	BTS-100K
R73	100KΩ		32.89	BTS-100K
R74	22KΩ		32.13	BTS-22K
R75	2.2Ω	1	32.61	BW-1-2.2
R76	27KΩ		32.85	BTS-27K
R77	10 Meg. 20%		32.99	BTS-10 Meg
R78	220KΩ		32.91	BTS-220K
R79	470KΩ		32.92	BTS-470K
R80	470Ω	2	32.113	BT-2-470
R81	1000Ω	5	117.27	AB-1000
R82	6.8 Meg.		32.46	BTS-6.8 Meg
R83	1 Meg.		32.33	BTS-1 Meg.
R84	4700Ω	1	32.74	BTA-4700
R85	4700Ω	1	32.74	BTA-4700
R86	1 Meg.		32.33	BTS-1 Meg.
R87	4.7 Meg.		32.98	BTS-4.7 Meg
R88	6800Ω		32.10	BTS-6800
R89	1 Meg.		32.33	BTS-1 Meg.
R90	4700Ω	1	32.74	BTA-4700
R91	1000Ω		32.8	BTS-1000
R92	22KΩ		32.13	BTS-22K
R93	22KΩ		32.13	BTS-22K
R94	8200Ω		32.77	BTS-8200
R95	8200Ω		32.77	BTS-8200
R96	1.5 Meg. 5%		32.97	BTS-1.5 Meg.
R97	100KΩ		32.89	BTS-100K
R98	2.2 Meg.		32.34	BTS-2.2 Meg
R99	220KΩ		32.91	BTS-220K
R100	2.2 Meg.		32.34	BTS-2.2 Meg
R101	2700Ω		32.57	BTS-2700
R102	8200Ω 5%		32.78	BTS-8200-5%
R103	10KΩ	1	32.79	BTA-10K
R104	10KΩ	1	32.79	BTA-10K
R105	1 Meg.		32.33	BTS-1 Meg.
R106	470KΩ		32.92	BTS-470K
R107	470KΩ		32.92	BTS-470K
R108	470KΩ		32.92	BTS-470K
R109	560Ω		32.68	BTS-560
R110	10Ω 5%		32.63	
R111	47KΩ 5%	1	32.87	BTA-47K-5%
R112	39KΩ 5%	1	32.86	BTA-39K-5%
R113	39KΩ 5%	1	32.86	BTA-39K-5%
R114	27KΩ	1	32.84	BTA-27K
R115	27KΩ		32.85	BTS-27K
R116	5000Ω	10	117.18	AB-5000
R117	10KΩ	1	32.79	BTA-10K

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA FADA PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C48	1500		17 45	GP1500M	1WSD15	GP2L-0015	1FM-215	RF Bypass
C49	1500		17 45	GP1500M	1WSD15	GP2L-0015	1FM-215	4th V. IF Decoupling
C50	82	500	17 37	1468-.0001	5WS7I	GP1K-100	1FM-31	4th V. IF Cath. Bypass
C51	1500		17 45	GP1500M	1WSD15	GP2L-0015	1FM-215	4th V. IF Pl., Bypass
C52	270	500	17 9	1468-.00025	5WS7J25	GP2K-270	1FM-325	IF Coupling
C53	10		17 33	GP10R	5WS0J	GP1K-10	MS-41	V. Diode Filter
C54	1500		17 45	GP1500M	1WSD15	GP2L-0015	1FM-215	V. Det. Pri. Bypass
C55	047	400	12 12	P488-047	PTE4S5		TM-15	Video Coupling
C56	047	600	12 38	P688-047	PTE6S5		TM-15	Video Coupling
C57	047	600	12 38	P688-047	PTE6S5		TM-15	Video Coupling
C58	047	600	12 38	P688-047	PTE6S5		TM-15	Video Coupling
C59	25	400	12 17	P488-25	GT4P25		TC-3	DC Rest. Decoupling
C60	470	500	17 96	1468-.0005	5WS7S	GP2K-470	1FM-35	Video Compensation
C61	1500		17 45	GP1500M	1WSD15	GP2L-0015	1FM-215	1st. S. IF Cath. Bypass
C62	1500		17 45	GP1500M	1WSD15	GP2L-0015	1FM-215	1st S. IF Decoupling
C63	.01	400	12 6	P488-.01	PTE4S1	GP2-335-01	TM-11	2nd S. IF Grid Filter
C64	1500		17 45	GP1500M	1WSD15	GP2L-0015	1FM-215	2nd S. IF Cath. Bypass
C65	1500		17 45	GP1500M	1WSD15	GP2L-0015	1FM-215	2nd S. IF Screen Bypass
C66	1500		17 45	GP1500M	1WSD15	GP2L-0015	1FM-215	2nd S. IF Plate Decoupling
C67	50		17 18	GP50M	5WS0J	GP1K-50	1FM-45	Limiter Grid Filter
C68	6800		17 35	GP6800M	1D3D7	GP3M-0068	1FM-27	Limiter Decoupling
C69	270		17 9	1468-.00025	5WS7Z5	GP2K-500	1FM-325	RF Bypass
C70	.002	600	12 2	P688-002	PTE6D2	GP2M-002	TM-22	Audio Coupling
C71	.01	400	12 6	P488-.01	PTE4S1	GP2-335-01	TM-11	Tone Compensation
C72	.01	400	12 6	P488-.01	PTE4S1	GP2-335-01	TM-11	Audio Coupling
C73	.002	600	12 2	P688-002	PTE6D2	GP2M-002	TM-22	De-emphasis
C74	.0047	600	12 7	P688-005	PTE6D5	GP2M-0047	TM-25	Audio Coupling †
C75	.005	600	12 19	P688-005	PTE6D5	GP2M-0047	TM-25	Output Plate Bypass
C76	.047	600	12 12	P688-05	PTE6S5		TM-15	Sync. Coupling
C77	270	500	17 9	1468-.00025	5WS7Z5	GP2K-270	1FM-325	1st Sync. Amp. Plate Bypass
C78	.1	400	12 15	P488-1	PTE4P1		TM-1	1st Sync. Amp. Plate Decoupling
C79	270		17 9	1468-.00025	5WS7Z5	GP2K-270	1FM-325	Sync. Coupling
C80	.05	400	12 13	P488-05	PTE4S5		TM-15	Sync. Coupling
C81	.01	400	12 6	P488-.01	PTE4S1	GP2-335-01	TM-11	Vert. Sync. Coupling
C82	.002	600	12 2	P688-.002	PTE6D2	GP2M-002	TM-22	Integrator Net.
C83	.002	600	12 2	P688-.002	PTE6D2	GP2M-002	TM-22	Integrator Net.
C84	.005	600	12 7	P688-.005	PTE6D5	GP2M-005	TM-25	Integrator Net.
C85	4700	500	17 40	1467-005	1D5D5	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C86	.05	600	12 38	P688-05	PTE6S5		TM-15	Vert. Discharge
C87	.1	400	12 15	P488-1	PTE4P1		TM-1	Vert. Sweep Coupling
C88	82	500	17 37					Hor. Sync. Coupling
C89	015	400	12 36	P488-015	PTE6S15			Fixed Trimmer
C90	.004	400	12 35	P688-004	PTE6D4		TM-24	AFC Filter
C91	.05	400	12 13	P488-05	PTE4S5		TM-15	AFC Filter
C92	.05	600	12 38	P688-05	PTE6S5		TM-15	Hor. AFC Screen Bypass
C93	.004	600	12 35	P688-004	PTE6D4		TM-24	AFC Filter
C94	.015	400	12 36	P488-015	PTE6S15			Phase Shifter
C95	.004	400	12 35		PTE4D4		TM-24	Hor. Osc. Grid Cap.
C96	.05	600	12 38	P688-05	PTE6S5		TM-15	Hor. Osc. Screen Bypass
C97	390	500	17 38	1468-.0004	5WS7A	GP2K-390	1FM-34	Differentiator Net.
C98	.01	400	12 6	P488-01	PTE4S1	GP2-335-01	TM-11	Hor. Sweep Coupling
C99	.05	600	12 7	P688-05	PTE6S1	GP2-335-01	TM-11	Hor. Sweep Coupling
C100	680	500	17 39		1W5T7	GP2K-680	1FM-37	Hor. Discharge
C101	.05	600	12 38		PTE6S5		TM-15	Hor. Output Screen Bypass
C102	.1	200	12 14		P288-1		TM-1	Hor. Output Cath. Bypass
C103	.15	200	12 27		P288-15			Damper Filter
C104	.05	400	12 13		PTE4S5		TM-15	Damper Filter
C105	.25	600	12 61		684-25		TC-2	Damper Filter
C106	330	500	17 97			GP2K-330		Fixed Trimmer *
C107	330	500	17 97			GP2K-330		Fixed Trimmer *
C108	500	15000	17 95			410-500		Voltage Doubler Cap.
C109	500	15000	17 41					HV Filter
C110	500	15000	17 95			410-500		HV Filter
C111	.01	400	12 22	P488-01	PTE4S1	GP2-335-01	TM-11	Line Filter
C112	.01	400	12 22	P488-01	PTE4S1	GP2-335-01	TM-11	Line Filter

† Not used in all models.
* Some models use 220MMF in this application.
† Some models use .01MFD in this application.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FADA PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1500Ω	4	52-49		52-49	Focus control, Wire Wound
B	500Ω	4				Brightness control
R2A	1 Meg.	1		B11-137 *		Vert. hold control, front
B	50KΩ	1	52-21	B11-123 *	52-21	Horiz. hold control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
R3A	10KΩ	1		B17-116 *	52-22	Contrast control, front
B	1 Meg.	1	52-22	B13-137X *		Volume control, tapped at 200KΩ, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
D	Switch			T6-1 *		Attach per instructions in "Concentrikit".
R4	20Ω	2	52-52	W-20	43-20	Horiz. centering control, Wire Wound
R5	20Ω	2	52-26	W-20x10	43-20CT	Vert. centering control, tapped at 10Ω
R6	500KΩ	1	52-23	QII-114	M-19-S	Vert. linearity control
R7	2.5 Meg.	1	52-24	QII-239	M-84-S	Height control
R8	500Ω	2	52-55	W-500	43-500	Horiz. linearity control, Wire Wound
R9	2.2MΩ	1	52-38	QII-130	M-52-S	Horiz. drive control

* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FADA PART No.	IRC PART No.	IDENTIFICATION CODES
					ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R10	150Ω	1			RF Grid
R11	150Ω	1			RF Grid
R12	4700Ω 20%	1		BTS-4700	RF Plate
R13	4700Ω 20%	1		BTS-4700	RF Plate

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FADA PART No.	IRC PART No.	IDENTIFICATION CODES
R14	1000Ω 20%	1		BTS-1000	RF Plate Decoupling
R15	1 Meg. 20%	1			Mixer Grid
R16	10KΩ	1			Mixer Grid Shunt
R17	1000Ω 20%	1		BTS-1000	Mixer Plate Decoupling
R18	150Ω	1			Decoupling Network
R19	4700Ω 20%	1		BTS-4700	Osc. Plate
R20	470Ω 20%	1			Osc. Cathode
R21	100KΩ 20%	1		BTS-100K	Osc. Grid
R22	100KΩ 20%	1		BTS-100K	Osc. Grid
R23	100KΩ	1		BTS-1000	AGC Network
R24	680KΩ 5%	1	32.93	BTS-680K-5%	Voltage Divider
R25	1000Ω	1	32.8	BTS-1000	AGC Network
R26	10KΩ 5%	1	32.80		1st Video IF Grid
R27	39Ω	1	32.64		1st Video IF Cathode
R28	820Ω	1	32.8	BTS-1000	1st Video IF Decoupling
R29	150Ω	1	32.4		Decoupling Network
R30	150Ω	1	32.4		Decoupling Network
R31	1000Ω	1	32.8	BTS-1000	AGC Network
R32	10KΩ 5%	1	32.80		2nd Video IF Grid
R33	39Ω	1	32.64		2nd Video IF Cathode
R34	1000Ω	1	32.8	BTS-1000	2nd Video IF Decoupling
R35	150Ω	1	32.4		Decoupling Network
R36	4700Ω 5%	1	32.75		3rd Video IF Grid
R37	39Ω	1	32.64		3rd Video IF Cathode
R38	2700Ω	1	32.57	BTS-2700	3rd Video IF Plate
R39	1000Ω	1	32.8	BTS-1000	3rd Video IF Decoupling
R40	150Ω	1	32.4		Decoupling Network
R41	10KΩ	1	32.11	BTS-10K	AGC Network
R42	18KΩ	1	32.81	BTS-18K	AGC Network
R43	8200Ω	1	32.77	BTS-8200	AGC Network
R44	680Ω	1	32.31	BTS-680	Voltage Divider
R45	2700Ω	1	32.57	BTS-2700	Voltage Divider
R46	150Ω	1	32.4		4th Video IF Cathode
R47	56000Ω 5%	1	32.76		4th Video IF Plate
R48	1000Ω	1	32.8	BTS-1000	4th Video IF Decoupling
R49	250000Ω 5%	1	32.73	BTS-250K-5%	Video Det. Diode Load
R50	470KΩ	1	32.92	BTS-470K	Video Amp. Grid
R51	3300Ω	1	32.32	BTS-3300	Video Amp. Plate
R52	680Ω	1	32.10	BTS-680	Low Pass Filter
R53	470KΩ	1	32.92	BTS-470K	Video Output Grid
R54	1.2 Meg. 5%	1	32.96	BTS-1.2 Meg. 5%	Bias Network See Note 1
R55	220Ω	1	32.5		Video Output Cathode
R56	2200Ω	10	117.41	AB-2250	Video Output Plate Wire Wound
R57	10KΩ	1	32.11	BTS-10K	Isolation
R58	100KΩ	1	32.89	BTS-100K	Picture Tube Grid
R59	1 Meg.	1	32.33	BTS-1 Meg.	DC Rest. Load
R60	47KΩ	1	32.15	BTS-47K	Voltage Divider
R61	150KΩ	1	32.90	BTS-150K	Voltage Divider
R62	150KΩ	1	32.90	BTS-150K	Acc. Sense Load
R63	100Ω	1	32.2		1st Sound IF Cathode
R64	1000Ω	1	32.8	BTS-1000	1st Sound IF Decoupling
R65	470KΩ	1	32.92		2nd Sound IF Grid
R66	100Ω	1	32.2		2nd Sound IF Cathode
R67	3300Ω	1	32.32	BTS-3300	2nd Sound IF Screen
R68	1000Ω	1	32.8	BTS-1000	2nd Sound IF Plate Decoupling
R69	22KΩ	1	32.13		Limiter Grid
R70	10KΩ	1	32.79		Limiter Decoupling
R71	10KΩ	1	32.11	BTS-10K	Voltage Divider
R72	100KΩ	1	32.89	BTS-100K	Disc. Diode Load
R73	100KΩ	1	32.89	BTS-100K	Disc. Diode Load
R74	22KΩ	1	32.13	BTS-22K	De-emphasis
R75	2.2Ω	1	32.61	BW-1-2.2	Disc. Filament-Wire Wound
R76	27KΩ	1	32.85	BTS-27K	Tone Compensation
R77	10 Meg. 20%	1	32.99	BTS-10 Meg.	AF Grid
R78	220KΩ	1	32.91	BTS-220K	AF Plate
R79	470KΩ	1	32.92	BTS-470K	Output Grid
R80	470Ω	2	32.113	BT-2-470	Output Cathode
R81	1000Ω	5	117.27	AB-1000	Filter-Wire Wound
R82	6.8 Meg.	1	32.46	BTS-6.8 Meg.	Voltage Divider
R83	1 Meg.	1	32.33	BTS-1 Meg.	1st Sync. Amp. Grid
R84	4700Ω	1	32.74	BTA-4700	1st Sync. Amp. Plate
R85	4700Ω	1	32.74	BTA-4700	1st Sync. Amp. Plate Decoupling
R86	1 Meg.	1	32.33	BTS-1 Meg.	Sync. Sep. Grid
R87	4.7 Meg.	1	32.98	BTS-4.7 Meg.	Voltage Divider
R88	820Ω	1	32.10	BTS-680	Sync. Sep. Plate
R89	1 Meg.	1	32.33	BTS-1 Meg.	2nd Sync. Amp. Grid
R90	4700Ω	1	32.74	BTA-4700	2nd Sync. Amp. Plate
R91	1000Ω	1	32.8	BTS-1000	Decoupling
R92	22KΩ	1	32.13	BTS-22K	Voltage Divider
R93	22KΩ	1	32.13	BTS-22K	Integrator
R94	8200Ω	1	32.77	BTS-8200	Integrator
R95	8200Ω	1	32.77	BTS-8200	Integrator
R96	1.5 Meg. 5%	1	32.97	BTS-1.5 Meg. 5%	Vert. Osc. Grid
R97	100KΩ	1	32.89	BTS-100K	Voltage Divider
R98	2.2 Meg.	1	32.34	BTS-2.2 Meg.	Voltage Divider
R99	220KΩ	1	32.91	BTS-220K	Vert. Osc. Plate
R100	2.2 Meg.	1	32.34	BTS-2.2 Meg.	Vert. Output Grid
R101	2700Ω	1	32.57	BTS-2700	Vert. Output Cathode
R102	82000Ω 5%	1	32.78	BTS-8200-5%	Vert. Peaking
R103	10KΩ	1	32.79	BTA-10K	Vert. Output Decoupling
R104	10KΩ	1	32.79	BTA-10K	Vert. Output Decoupling
R105	1 Meg.	1	32.33	BTS-1 Meg.	Horiz. Sync. Disc. Load
R106	470KΩ	1	32.92	BTS-470K	Horiz. Sync. Disc. Load
R107	470KΩ	1	32.92	BTS-470K	Horiz. Sync. Disc. Load
R108	470KΩ	1	32.92	BTS-470K	Horiz. AFC Filter Network
R109	560Ω	1	32.68	BTS-560	Horiz. AFC Grid
R110	10Ω 5%	1	32.63		Horiz. AFC Cathode
R111	47KΩ 5%	1	32.87	BTA-47K-5%	Horiz. AFC Plate
R112	39KΩ 5%	1	32.86	BTA-39K-5%	Horiz. AFC Plate
R113	39KΩ 5%	1	32.86	BTA-39K-5%	Horiz. AFC Screen
R114	27KΩ	1	32.84	BTA-27K	Voltage Divider
R115	27KΩ	1	32.85	BTS-27K	Horiz. Osc. Grid
R116	5000Ω	10	117.18	AB-5000	Horiz. Osc. Plate-Wire Wound
R117	10KΩ	1	32.79	BTA-10K	Horiz. Osc. Screen

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FADA PART No.	IRC PART No.	IDENTIFICATION CODES
R118	6800Ω	1	32.10	BTS-6800	Differentiator
R119	220KΩ	1	32.91	BTS-220K	Horiz. Discharge Grid
R120	200KΩ 5%	1	32.304		Horiz. Discharge Plate
R121	75KΩ 5%	1	32.294		Voltage Divider
R122	20KΩ 5%	1	32.280		Filter
R123	56KΩ 20%	1	32.88	BTS-56K	Filter
R124	100Ω	1	32.2		Parasitic Supp.
R125	270KΩ 5%	1	32.307	BTS-270K-5%	Horiz. Output Grid
R126	100Ω	1	32.635		Horiz. Output Cathode
R127	14.3KΩ	10	117.49	AB-14,300	Horiz. Output Screen-Wire Wound
R128	4.7Ω	1	32.848		HV Rect. Filament-Wire Wound
R129	4.7Ω	1	32.848		HV Rect. Filament -Wire Wound
R130	510KΩ	1			HV Rect. Load
R131	510KΩ	1			HV Rect. Load
R132	510KΩ	1			HV Rect. Load
R133	510KΩ	1			HV Rect. Load
R134	1 Meg.	1	32.95		HV Filter
R135	270Ω	2	32.66	BW-2-270	Focus Coil Shunt-Wire Wound
R136	1500Ω	2	32.154	BW-2-1500	Focus Coil Shunt-Wire Wound See Note 2
R137	22Ω	2	32.123	BW-2-2200	Bias Network Wire Wound
R138A	230Ω	50	117.20		Bias Network-Wire Wound
B	1360Ω				Filter-Wire Wound
R139A	93Ω	2			Bias Network-Wire Wound
B	12Ω	1	117.21		Bias Network-Wire Wound
C	6750Ω	20			Bleeder-Wire Wound

Note 1. Some models use 1.5 Meg. resistor in this application.
Note 2. Not used on model G-925.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA FADA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC at 2.6A	690VCT .300ADC	5VAC at 9A	5VAC at 2A SEC. 4 12.6VCT at 5A	42.12	P-8156	P-3061	TP-365

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE	RATING SEC.	FADA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	37Ω CT	35Ω Tap at 9.5Ω	37.104				AFC Disc. Transformer
T3	165Ω	1300Ω	42.15-1	A-8121	T80-1	TFB-1	Vert. Block Osc. Trans.
T4	120Ω Tap at 78Ω	SEC. 1 7.2Ω Tap at .5Ω	42.43	A-8119	T80-4	TFB-4	Hor. Output Trans.
		SEC. 2 .0Ω					
		SEC. 3 0Ω					
T5	590Ω	5.9Ω	42.14-1	A-8115	A-3085	T80-1	Vert. Output Trans.
T6A	14Ω		37.101	DY-1			Hor. Deflection Coil
B	62Ω						Vert. Deflection Coil
T7	420Ω		37.212				Focus Coil

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA FADA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T8	11KΩ	2Ω	440Ω	.2Ω	42.44	A-3824	A-2904 #	RO-305	# Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA FADA PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	PM	3.9Ω	107.44	ST-109 MOD. P8-W	6A1	
SP2	PM CONE DIA.	3.9Ω V. C. DIA.	107.44	ST-109 MOD. P6-W	6A1	
SP3	6"	3/4"				
SP4	6"	3/4"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 cps	REPLACEMENT DATA FADA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
LI	.300A	62Ω	3 Henries	42.28	C-2326 #	C-2991 #	TR-3500#	# Drill one new mounting hole.

FADA MODELS G-925, 925, 965

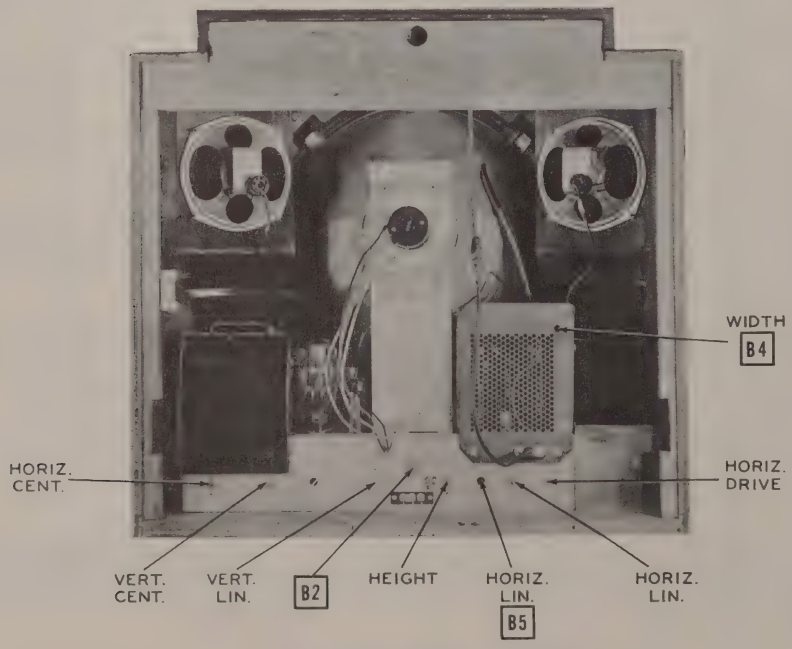
PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

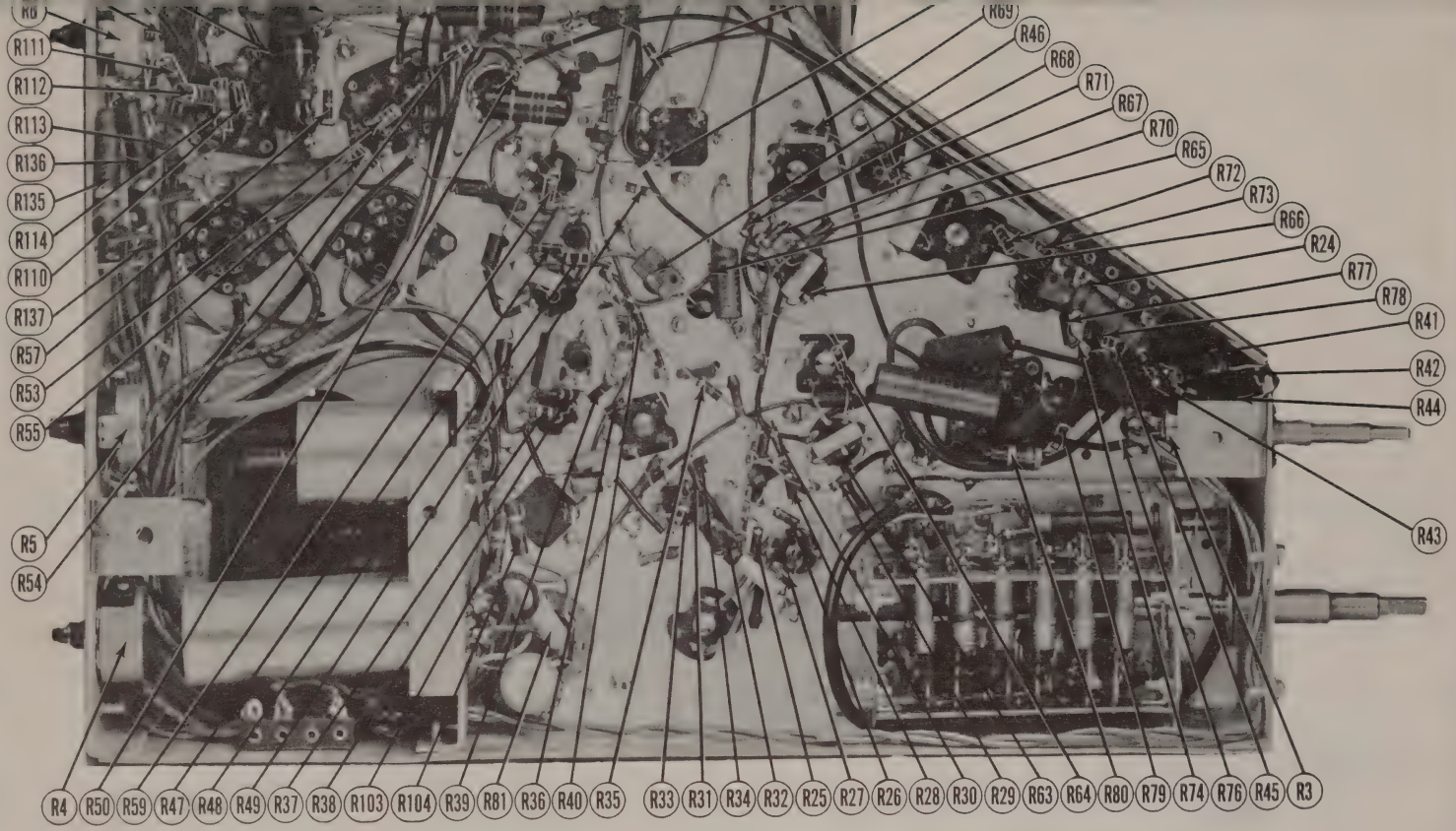
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	FADA PART No.	MEISSNER PART No.	
L2	Ant. Input	0Ω				Part of tuner.
L3	Interference Trap	0Ω				Part of tuner.
L4	Interference Trap	0Ω				Part of tuner.
L5	Fil. Choke	0Ω				Part of tuner
L6	Mixer Grid Trap	0Ω				Part of tuner.
L7	1st Video IF and Sound Trap	.2Ω	0Ω			Part of tuner.
L8	Fil. Choke	0Ω		37.89		
L9	2nd Video IF	.1Ω		37.96		
L10	Fil. Choke	0Ω		37.89		
L11	3rd Video IF	.1Ω		37.97		
L12	Fil. Choke	0Ω		37.89		
L13	4th Video IF	.1Ω		37.99		
L14	Sound Trap	0Ω		37.98		
L15	Fil. Choke	0Ω		37.89		
L16	5th Video IF	.1Ω		37.99		
L17	Fil. Choke	0Ω		37.89		
L18	Peaking	8Ω		37.90		180 microhenries. Wound on 39KΩ resistor.
L19	Peaking	9Ω		37.91		250 microhenries
L20	Peaking	5.5Ω		37.92		120 microhenries. Wound on 22KΩ resistor.
L21	Peaking	4.5Ω		37.93		93 microhenries.
L22	Peaking	3Ω		37.211		93 microhenries. Wound on 10KΩ resistor.
L23	Peaking	1.5Ω		37.210		20 microhenries.
L24	1st Sound IF	0Ω	0Ω	37.94		
L25	2nd Sound IF	0Ω	0Ω	37.94		
L26	Disc. Trans.	0Ω	0Ω	37.95		
L27	Width Cont.	.1Ω		37.215		
L28	Hor. Linearity	9Ω		37.214		

MISCELLANEOUS

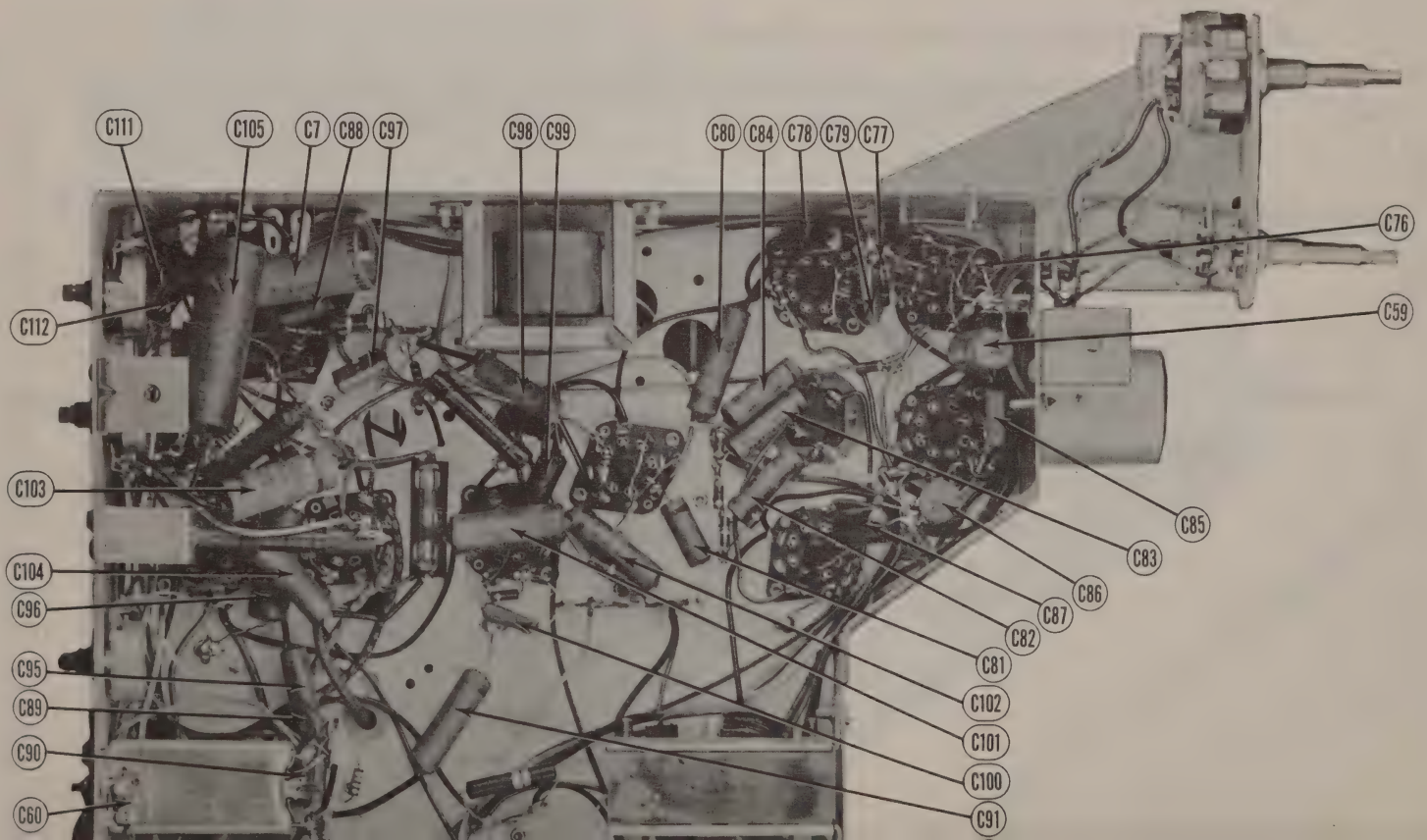
ITEM No.	PART NAME	FADA PART No.	NOTES
M1	RF Tuner	42.21	
M2	Fuse	122.22	.25A 250V
M3	Ion Trap		
	Cabinet	97.245	
	Safety Glass	92.279	Model 925
	Safety Glass	92.290	Model G-925
	End Cup	92.296	Picture Tube
	Knob	142.40	Station Selector
	Knob	142.41	Fine Tuning
	Knob	142.42	Focus, Hor. Hold, Off-On Volume
	Knob	142.43	Brightness, Vert. Hold, Contrast



CABINET–REAR VIEW



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION


C111
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C101
C100
C91

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL OSCILLATOR ALIGNMENT CHECK:

The sync link must be in the normal position (2 to 3). After turning the horizontal hold control to the maximum counter clockwise position, the picture should remain in horizontal sync. Remove the picture momentarily by turning the contrast control fully counter-clockwise and then return it to the normal operating position. This should pull the picture back into synchronization.

Now turn the horizontal hold control fully clockwise. The picture should remain in sync. Momentarily remove the signal and again the picture should pull into sync if receiver is functioning properly.

If the receiver functions properly under these checks, it is not necessary to align the horizontal oscillator circuit. However, if the picture is not normal or stable, the horizontal oscillator must be aligned.

SLIGHT RETOUCH ALIGNMENT:

If the receiver failed in the above check to hold sync at either extreme of the hold control or after momentary removal of the signal, it may be possible to align the horizontal oscillator by making slight adjustments. If this fails, it will be necessary to completely re-align the horizontal oscillator circuit.

Tune in a TV station and adjust tuning for best sound quality. Sync the picture and adjust the contrast control to slightly less than normal position. Turn the horizontal hold control to the point where the horizontal oscillator fails to hold or pull in. Remove signal. Turn B2 frequency adjustment (located at rear of chassis) until oscillator pulls into sync. Now check the pull-in and hold for the other extreme of the horizontal hold control.

COMPLETE ALIGNMENT:

Tune in a TV station for the best sound quality. Adjust vertical hold control to vertically sync the picture and adjust the contrast control to slightly less than normal. Turn B2 frequency adjustment until picture syncs horizontally. If blanking bar is present on picture, adjust B1 (phasing adjust screw) until blanking bar moves to the right and off the raster. If ripples occur in the raster turn B1 in a clockwise direction until the unstable condition is removed. The length of this adjustment screw in its correct position is usually about 1/2 inch beyond the bushing.

Turn horizontal hold control fully counter-clockwise and adjust B2 until picture fails to sync. Now slowly turn B2 to the point where the picture syncs again. Readjust B1 so that the left side of picture is close to the left side of the raster but does not fold over.

Turn horizontal hold fully clockwise. Right side of picture should be close to right side of raster but does not fold over. If picture does fold over, readjust B1.

When signal is restored after momentary removal of the signal, the picture should fall into sync. If picture fails to fall into sync, turn B2 counter-clockwise until picture syncs in.

Turn horizontal hold fully counter-clockwise. Picture should fall back into sync after momentary removal of signal.

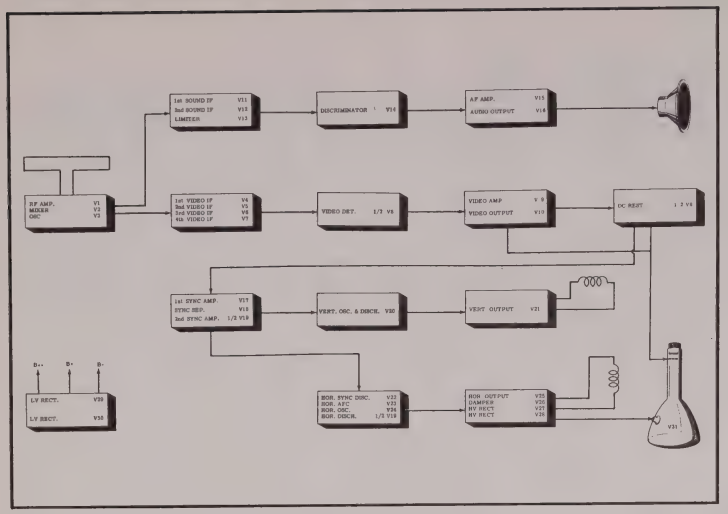
If picture fails to pull in sync after momentary removals of the signal in both extremes of the horizontal hold control, there may not be a sufficient pull-in range, through not necessarily. A pull-in of 3/4 of the hold control range should be satisfactory.

Excessive pull-in is objectionable because high control circuit sensitivity gives greater reaction to noise pulses. This may also affect the vertical sync. and equalizing pulses which tend to cause a bend in the top portion of the raster.

This condition is more noticeable in the 1 to 2 position of the sync link.

HORIZONTAL LINEARITY ADJUSTMENTS:

Turn the horizontal drive trimmer (B3) clockwise as far as possible without crowding the right side of the picture. (Some models do not have this trimmer. In those models, it is replaced with a control marked "horizontal peaking"). This provides maximum voltage for the picture tube second anode. If the set has a horizontal width slug (B4) adjust it until the picture fills the mask horizontally. Adjust the horizontal linearity slug (B5) for best linearity of picture from left to right. (It may be necessary to slightly readjust B3).



BLOCK DIAGRAM

DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove thirteen screws holding rear cover. Push down and remove cover.
3. Remove top panel interlock plug.
4. Remove two screws holding top panel. Remove panel.
5. Remove picture tube base socket, beam bender and HV cap.
6. Remove two screws holding front panel. Remove panel.
7. Slightly loosen four screws holding safety glass. Push fiber strips aside. Remove glass.
8. Remove two screws holding top picture tube supports. Remove supports. Remove picture tube from the front.
9. Remove two speaker plugs.
10. Remove screws holding antenna terminal strip.
11. Remove five 7/16" hex head bolts holding chassis. Remove chassis.
12. Remove four 3/8" square nuts holding each speaker. Remove two speakers.

GENERAL ELECTRIC
MODEL 165 (BATTERY-LINE OPERATED)

GENERAL ELECTRIC
MODEL 165 (BATTERY-LINE OPERATED)

GENERAL ELECTRIC MODEL 165

TRADE NAME	General Electric Model 165
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Park, Syracuse, New York
TYPE SET	Three Power Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 1T4 RF Amp., 1R5 Converter, 1T4 IF Amp., 1S5 DET-AVC-AF, 3V4 Power Output
POWER SUPPLY	105-115 Volts AC-DC or 9 Volts "A" Supply and 90 Volts "B" Supply in Pack Form
RATING	.16 Amp. at 117 Volts AC or 50MA at 9 Volts DC and 12MA at 90 Volts DC
TUNING RANGE	BROADCAST 540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointer, turn tuning gang fully open and set pointer 1-7/16" to the right of the left hand end of the notch cut in the chassis apron.

Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to stator on center section of tuning gang. Low side to B-.	455KC (400 ~ Mod.)	Tuning gang fully closed	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1500KC	1500KC	"	A5, A6, A7,	Replace set in cabinet. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	600KC	600KC	"	A8	Replace set in cabinet. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 2 and 3 until no further improvement can be made.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		G. E. PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	1T4	1T4	6AR	
V2	Converter	1R5	1R5	7AT	
V3	IF Amp.	1T4	1T4	6AR	
V4	Det.-AVC-AF	1S5	1S5	6AU	
V5	Power Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	G. E. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	150	RCE-095	AF88D40A	UP4415C20		EL-224†	■ Filter.
B	40	150					TVA-9	▲ Filter.
C	200	20						Filament Bypass.
C2	100	6	UCE-067	PRS 6/100	BRH 601		UHC-106	Filament Bypass
C3	5		RCW-1075	C15KNPO	5W5V5	NPOK-5	MS-55	RF Coupling.
C4	47		RCW-1073	GP47M	5W5Q5	GP1K-47	1FM-45	Osc. Grid Cap.
C5	.05	200	UCC-635	P288-05	PTE4S5		TM-15	AVC Filter.
C6	.02	400	UCC-631	P488-02	PTE4S5		TM-12	Decoupling.
C7A	220			GP220M	5W5T25	GP2K-220	1FM-325	Diode RF Filter.
B	2000			GP2000M	ZYW4D2	GP2M-002	68P27	Audio coupling.
C	220		RCW-3015	GP220M	5W5T25	GP2K-220	1FM-325	AF Plate Bypass.
D	5000			GP5000M	ZYW4D5	811-005	68P6	Audio Coupling.
E	5000			GP5000M	ZYW4D5	811-005	68P6	AF Screen Bypass.
C8	.003	400	UCC-623	P688-003	PTE6D3	GP2M-003	68P3	Output Plate Bypass.
C9	.05	200	UCC-635	P288-05	PTE4S5		TM-15	Filament Bypass.
C10	.05	600	UCC-635	P688-05	PTE6S5		72P51	Line Isolation
C11	.03	600	UCC-633	P688-03	PTE6S5		TM-13	Line Filter

† Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	G. E. PART No.	IRC PART No.	CLAROSTAT PART No.	
R1A	500KΩ	½	RRC-083	Q13-133	15/16-60-Z	Volume control.
B	Switch		Not Req.	76-2*	DPST. SW. #	

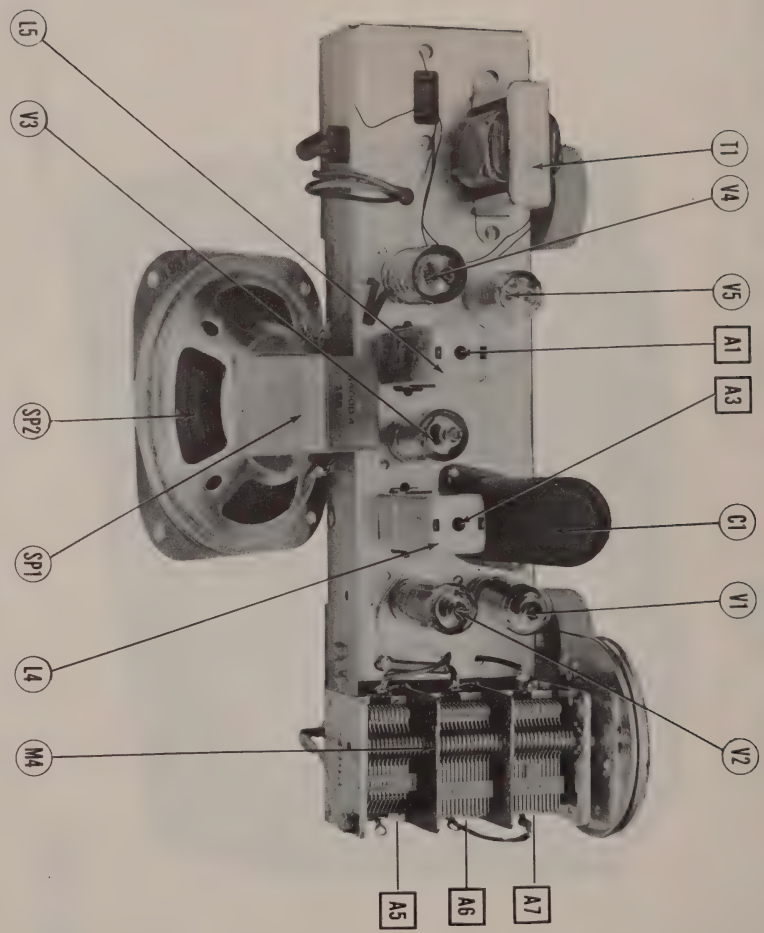
* Attach to R1A per instructions.
\# Attached at factory.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	G. E. PART No.	IRC PART No.	
R2	100KΩ	½	URD-097	BTS-100K	Osc. Grid.
R3	5600Ω	½	URD-067	BTS-5600	Screen Dropping.
R4	3.9 Meg.	½		BTS-3.9 Meg.	AVC Network. - See Note 1.
R5	2.2 Meg.	½	URD-129	BTS-2.2 Meg.	AVC Network
R6	4.7 Meg.	½	URD-137	BTS-4.7 Meg.	AF Grid.
R7	3.9 Meg.	½		BTS-3.9 Meg.	AF Screen. - See Note 1.
R8	470KΩ	½	URD-113	BTS-470K	AF Plate.
R9	2.2 Meg.	½	URD-129	BTS-2.2 Meg.	Output Grid.
R10	470KΩ	½	URD-113	BTS-470K	Isolation.
R11	510Ω	½		BTS-470	Filament String. - See Note 2.
R12	560Ω	½		BTS-560	Filament String - See Note 3.
R13	1500Ω	½	URD-053	BTS-1500	Filament String.
R14	2700Ω	1	URE-059	BW-1-2700	Filter.
R15	2300Ω	10	RRW-027		Filament Dropping - Wire Wound.
R16	33Ω	1	URE-013		Surge Limiter.

Note 1. Some models use 3.3 Meg. resistor in this application.
Note 2. Some models use 470Ω resistor in this application.
Note 3. Some models use 680Ω resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		G. E. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	9.5KΩ	3.5Ω	415Ω	.4Ω	RTO-050	A-3879	A-2932	RO-16	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			G. E. PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST-113		
SP1	PM	3.5Ω	UOP-457	Mod. P4-X	4AO7	
	CONE DIA.	V. C. DIA.				
SP2	3 7/8"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA	
		PRI.	SEC.	G. E. PART No.	MEISSNER PART No.
L1	Loop Ant.	3Ω		RLL-038	
L2	RF Trans.	105Ω	5.5Ω	RTB-001	
L3	Osc. Coil	2.8Ω	7.5Ω	RLC-068	14-1074
L4	Input IF	21Ω	22Ω	RTL-052	16-6668
L5	Output IF	14Ω	17Ω	RTL-079	16-6669

SELENIUM RECTIFIER

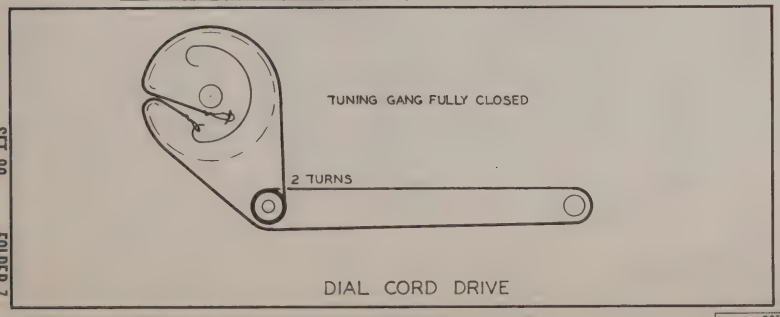
ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	G. E. PART No.	SYLVANIA PART No.		
M1	.067A	RER-001	NB-5		

BATTERIES

ITEM No.	VOLTAGE	G. E. PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	9V"A" 90V"B"				753			F6A60	

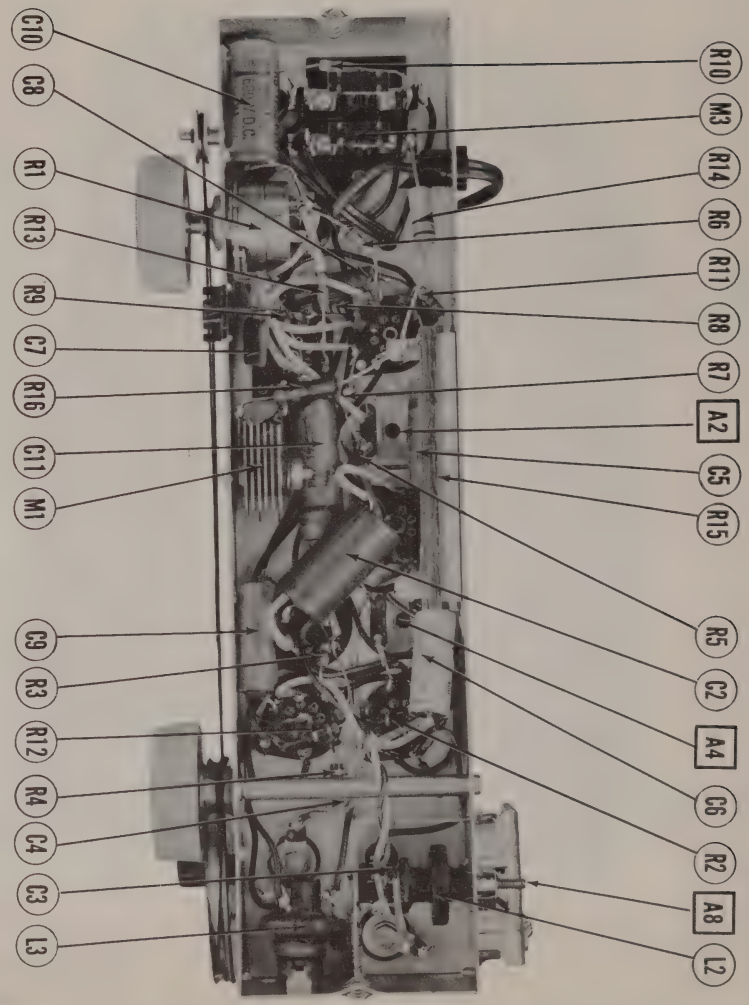
MISCELLANEOUS

ITEM No.	PART NAME	G. E. PART No.	NOTES
M3	Switch	RSW-058	AC/DC-Battery.
M4	3 Gang Var. Cap.	RCT-039	(30-502 MMF, 30-502MMF, 29-193MMF)
	Cabinet	RAU-310	
	Knob	RDK-136	
	Dial Pointer	RDP-040	
	Dial Scale	RDS-088	



DIAL CORD DRIVE

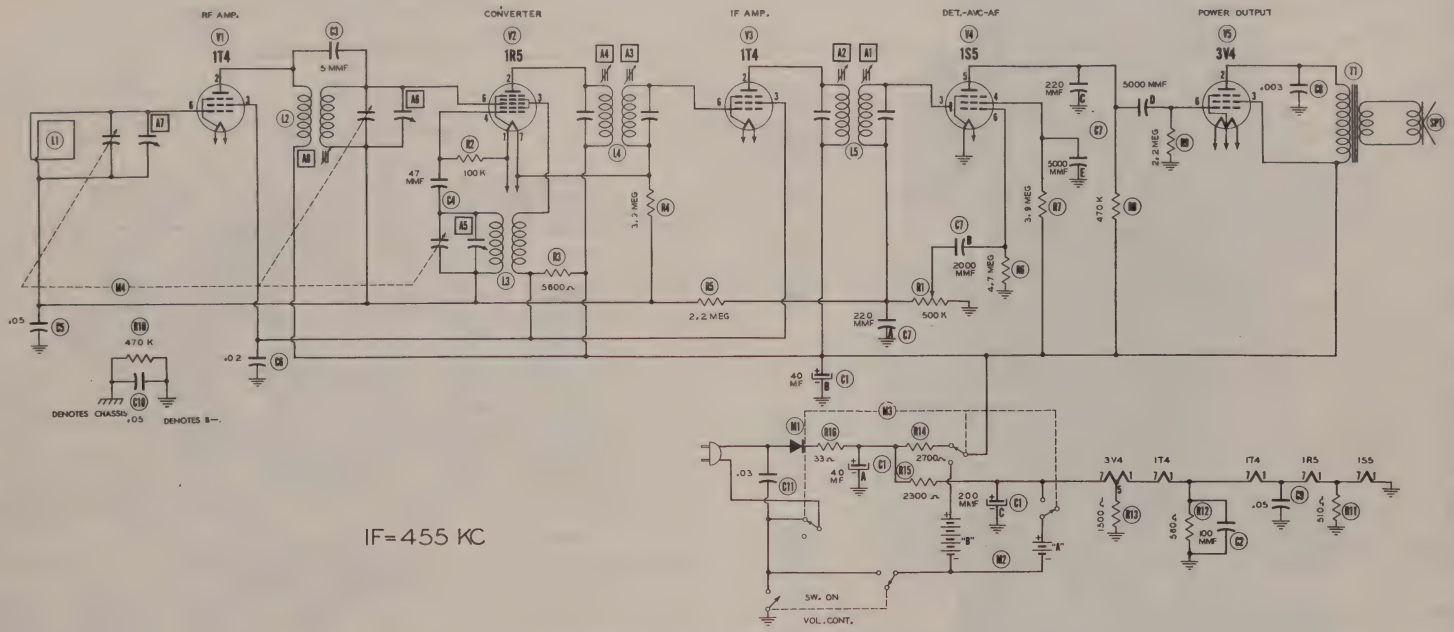
CHASSIS—BOTTOM VIEW



SET 88 FOLDER 7

GENERAL ELECTRIC MODEL 165

GENERAL ELECTRIC MODEL 165



NOTE: VOLTAGE AND RESISTANCE MEASUREMENTS TAKEN IN AC-DC POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1T4	2.9VDC	90VDC	67VDC	0V.	2.9VDC	0V.	4.2VDC
V 2	1R5	1.4VDC	90VDC	67VDC	8-10.5VDC	1.4VDC	.1VDC	2.9VDC
V 3	1T4	4.2VDC	90VDC	67VDC	0V.	4.2VDC	2.9VDC	5.7VDC
V 4	1S5	0V.	0V.	-.2VDC	4.7VDC	26VDC	0V.	1.4VDC
V 5	3V4	5.7VDC	87VDC	90VDC	0V.	7.1VDC	0V.	8.7VDC

‡ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1T4	*	†2.7KΩ	†8.3KΩ	0Ω	*	1.5 Meg.	*
V 2	1R5	*	†2.7KΩ	†8.3KΩ	100KΩ	*	1.5 Meg.	*
V 3	1T4	*	†2.7KΩ	†8.3KΩ	1.5 Meg.	*	*	*
V 4	1S5	*	Inf.	500KΩ	†3.3 Meg.	†470KΩ	4.7 Meg.	*
V 5	3V4	*	†3.5KΩ	†2.7KΩ	Inf.	*	2.2 Meg.	*

* DO NOT MEASURE FILAMENT RESISTANCE WITH OHMMETER.
† MEASURED FROM OUTPUT OF M1.

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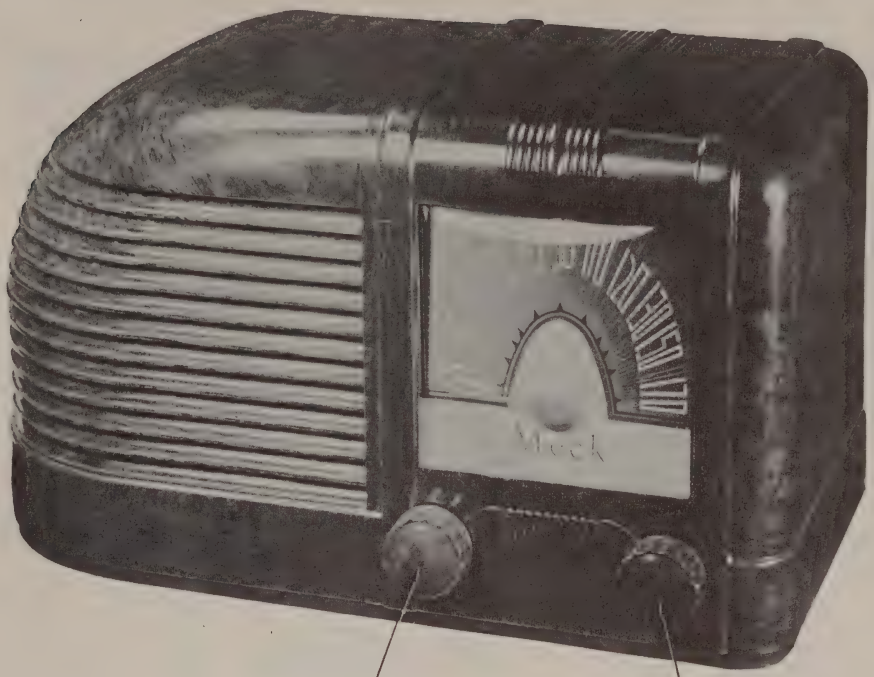
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

MECK
MODELS EF-730, EG-731



MECK
MODELS EF-730, EG-731

MECK MODEL EF-730

TRADE NAME	Meck, Models EF-730, EG-731 (Ch. 10003)
MANUFACTURER	John Meck Industries, Plymouth, Indiana
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 12BE6 Converter, 12BA6 IF Amp., 12AT6 DET-AVC-AF, 50B5 Power Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .27 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	540-1720KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap fully closed and set pointer parallel with base of dial. Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to stator on rear section of tuning gang. Low side to B-.	455KC (400 ~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1720KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	Tune for max. output.	"	A6	"

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PARTS LIST AND DESCRIPTIONS

MECK MODEL EF-730

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MECK PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1A	Converter	12BE6	12BE6	7CH	
B	Converter	12SA7	12SA7	8R	
V2A	IF Amp.	12BA6	12BA6	7BK	
B	IF Amp.	12SK7	12SK7	8N	
V3A	DET. -AVC-AF	12AT6	12AT6	7BT	
B	DET. -AVC-AF	12SQ7	12SQ7	8Q	
V4A	Power Output	50B5	50B5	7BZ	
B	Power Output	50L6GT	50L6GT	7AC	
V5A	Rectifier	35W4	35W4	5BQ	
B	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MECK PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	50	150	CL-10010	PRSA150/50-50	EDL5515		TA-505	Filter-Blue
B	50	150						Filter-Red
C2	.05	400	CP-12503	P488-05	PTE4S5		TM-15	AVC Filter
C3	250		CM-15251	GP250M	5W5T25	GP2K-250	1FM-325	Diode RF Filter
C4	250		CM-15251	GP250M	5W5T25	GP2K-250	1FM-325	Diode RF Filter
C5	.005	600	CP-12502	P688-005	PTE6D5	811-005	TM-25	Audio Coupling
C6	.005	600	CP-12502	P688-005	PTE6D5	811-005	TM-25	Audio Coupling
C7	.02	200	CP-12203	P488-02	PTE4S2		TM-12	Output Plate Bypass
C8	.05	400	CP-14503	P488-05	PTE4S5		TM-15	Line Filter
C9	.15	400	CP-14154	P488-15	GT4P2		72P53	Line Isolation

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MECK PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	VC-12110	Q13-137	AM-63-Z	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SW-A	Attach to R1A per instructions

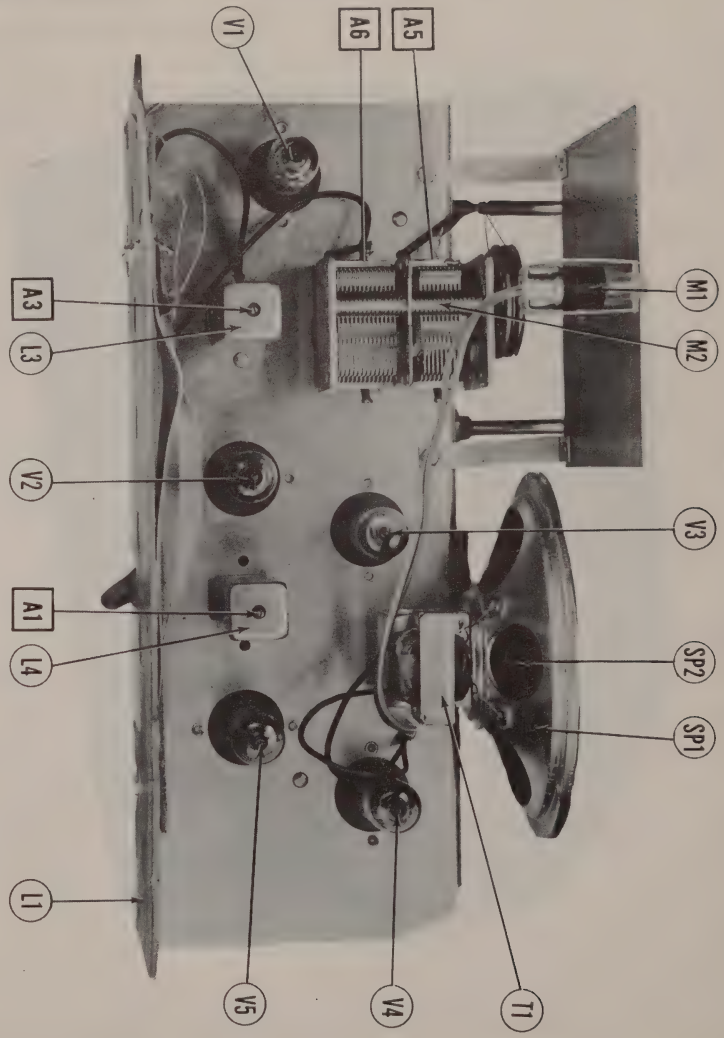
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MECK PART No.	IRC PART No.	IDENTIFICATION CODES
R2	22KΩ	½	RC-12202	BTS-22K	Osc. Grid
R3	2.2 Meg.	½	RC-12204	BTS-2.2 Meg.	AVC Network
R4	100KΩ	½	RC-11003	BTS-100K	Diode Filter
R5	10 Meg.	½	RC-11005	BTS-10 Meg.	AF Grid
R6	220KΩ	½	RC-12203	BTS-220K	AF Plate
R7	470KΩ	½	RC-14703	BTS-470K	Output Grid
R8	150Ω	½	RC-31500	BW-½-150	Output Cathode
R9	1000Ω	1	RC-41001	BW-1-1000	Filter
R10	68Ω	½		BW-½-68	IF Cathode

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: MECK PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	2KΩ	3.3Ω	146Ω	.4Ω	TO-10000	A-3876 †	A-2928 †	RO-2 ‡	† Bend mounting tabs down and mount on original bracket. ‡ Mount on chassis.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: MECK PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-105 *		
SP1	PM	3.3Ω		MOD. P5-X	5A07 *	* Remount output transformer.
	CONE DIA.	V. C. DIA.				
SP2	4 3/4"	9/16"				

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: MECK PART No.	MEISSNER PART No.
L1	Loop Ant.	.1Ω	3Ω	AL-10021	
L2	Osc. Coil	.5Ω	4Ω	TRC-10013	14-1073
L3	Input IF	15Ω	17Ω	TS-10043	16-6678
L4	Output IF	15Ω	17Ω	TS-10043	16-6678

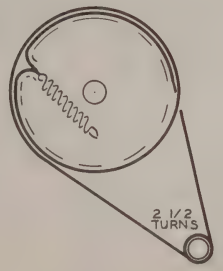
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: MECK PART No.		NOTES
M1	Bayonet	6-8	.15	Brown	DB-10000		Type #47

MISCELLANEOUS

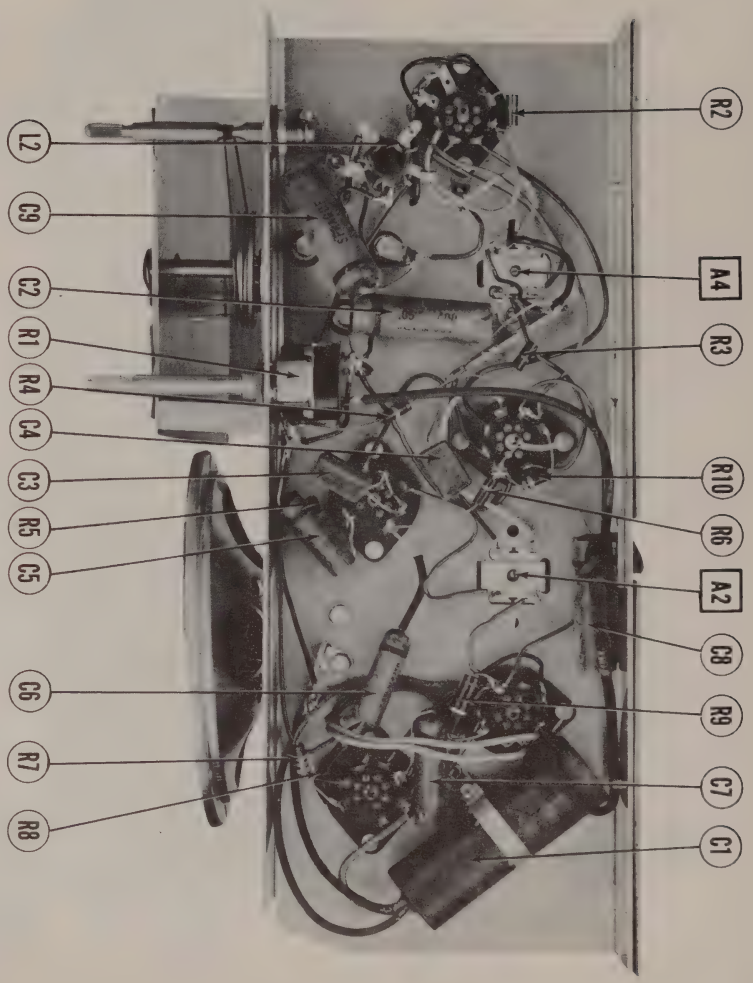
ITEM No.	PART NAME	MECK PART No.	NOTES
M2	2 Gang Var. Cap.	CV-10022	(17-450MMF, 31-210MMF)

TUNING GANG FULLY CLOSED



DIAL CORD DRIVE

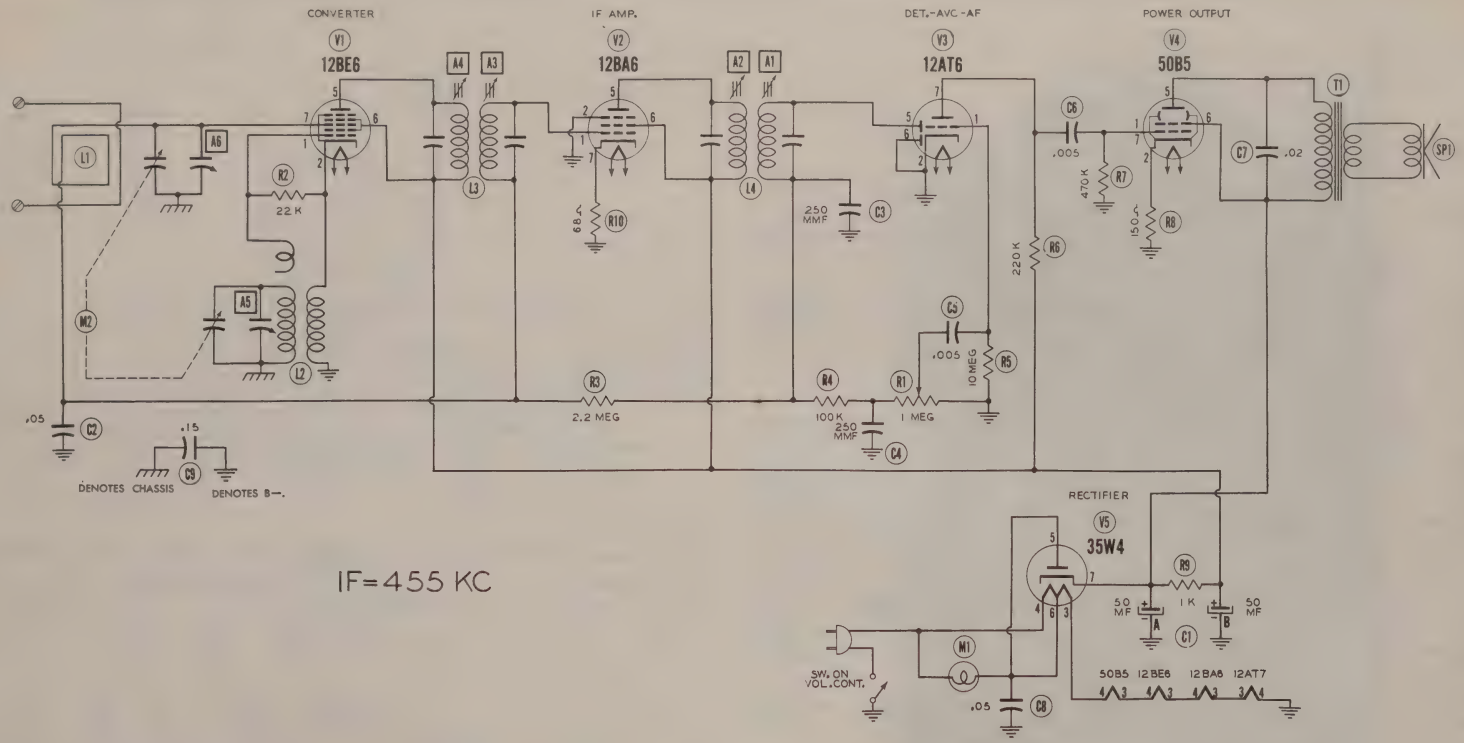
CHASSIS—BOTTOM VIEW



SET 89 FOLDER 8

MECK MODEL EF-730

MECK MODEL EF-730



IF=455 KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	§-7.4VDC	0V.	25VAC	37VAC	90VDC	90VDC	-.2VDC
V 2	12BA6	-.2VDC	0V.	12VAC	25VAC	90VDC	90VDC	.8VDC
V 3	12AT6	-.6VDC	0V.	12VAC	0V.	-.4VDC	0V.	50VDC
V 4	50B5	0V.	6.2VDC	37VAC	87VAC	112VDC	90VDC	0V.
V 5	35W4	90VDC	0V.	87VAC	117VAC	110VAC	110VAC	120VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.5Ω	24Ω	36Ω	†1000Ω	†1000Ω	3 Meg.
V 2	12BA6	3 Meg.	0Ω	12Ω	24Ω	†1000Ω	†1000Ω	68Ω
V 3	12AT6	10 Meg.	0Ω	12Ω	0Ω	1 Meg.	0Ω	†220KΩ
V 4	50B5	470KΩ	150Ω	36Ω	86Ω	†170Ω	†1000Ω	470KΩ
V 5	35W4	80KΩ	Inf.	86Ω	112Ω	109Ω	109Ω	80KΩ

† MEASURED FROM PIN 7 OF V5.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

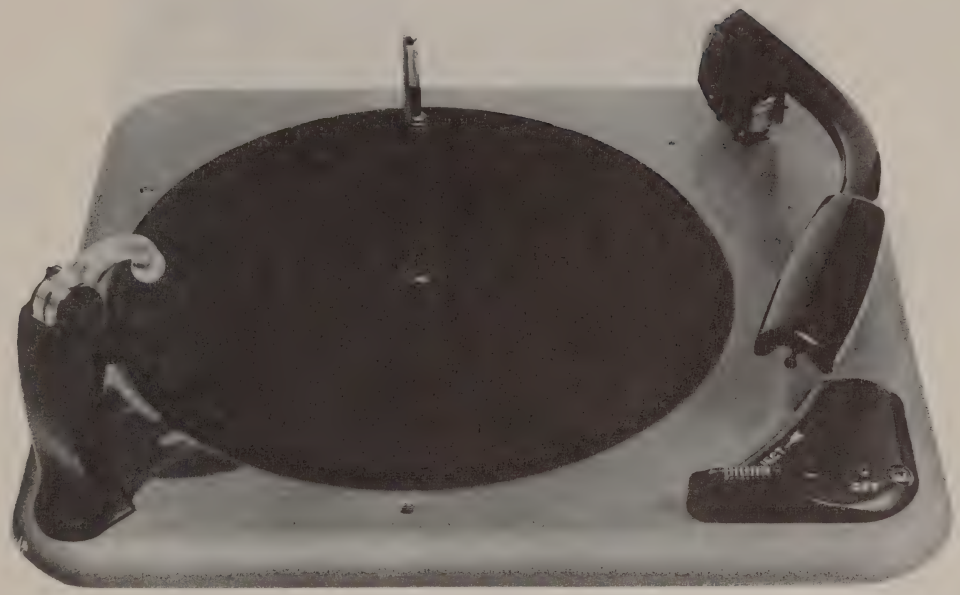

FIG. 1—TOP VIEW

GENERAL INFORMATION

The Series 700F record changer is of the single-post type, featuring single-button control and eccentric spindle cam record selection. It is designed to play automatically up to ten 12-inch records or twelve 10-inch records, not intermixed. The last record will be repeated until the changer is turned off. The pickup arm support is designed so as to prevent damage to the mechanism if the pickup arm is handled during any part of the change cycle.

Parts should be ordered from the manufacturer of the receiver using this changer.

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SERIES 700F
CHANGER

SERIES 700F
CHANGER

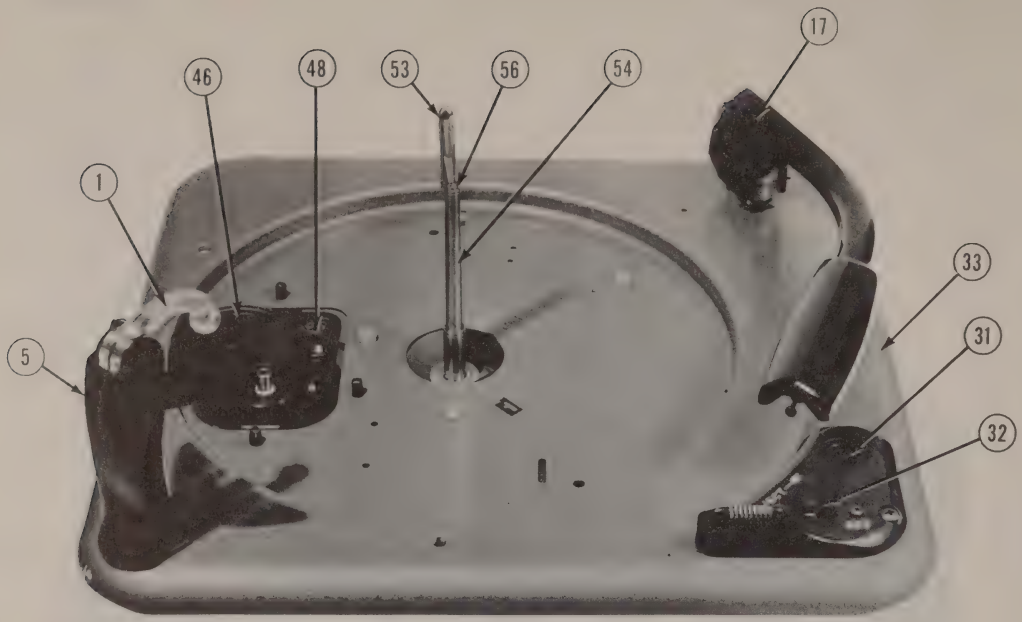

FIG. 2—TOP VIEW LESS TURNTABLE

AUTOMATIC OPERATION

1. Raise the record stabilizer (1) to its vertical position.
2. Move the record support (5) forward for 10-inch records, and away from the spindle for 12-inch records.
3. Place the records to be played on the spindle so they will rest on the record support (5) and the eccentric (56) or step of the spindle.
4. Lower the record stabilizer to the record.
5. Move the "On-Off" switch (32) to the "On" position.
6. Push the switch plate (31) in the direction indicated by the arrow. This sets the changing mechanism into operation, dropping the first record to the turntable. The changer will now play the entire stack of records and will continue playing the last record until the changer is shut off.
7. A record may be rejected at any time while playing by moving the switch plate.
8. To stop the changer, move the "On-Off" switch (32) toward the spindle; raise the tone arm and move it out to its rest position.
9. Raise the record stabilizer.
10. Remove the records from the turntable.

CAUTION: Never try to remove records when changer is in middle of cycle. Always allow changer to complete cycle.

MANUAL OPERATION

1. Raise the stabilizer (1) to its vertical position.
2. Push the record support (5) into the 12-inch position.
3. Place the record to be played on the turntable.
4. Move the "On-Off" switch to the "On" position.
5. Lift the tone arm to disengage it from its rest, and place the pickup arm on the record.
6. After the record is completed, turn the "On-Off" switch (32) to the "Off" position, and place the tone arm on its rest.

CHANGE CYCLE

When the switch button (32) is turned to the "On" position, power is supplied to the motor, causing the turntable (6) to rotate. The automatic mechanism is then put into operation by moving the switch plate (31) in the direction indicated by the arrow. By this action, the reject trip lever (43), which is connected to the switch plate, is pulled against the cam trip actuator (58). This moves the cam trip actuator enough to allow the spring-loaded pinion actuating lever (61) to raise, which, in turn, lifts the brass pinion (15). As a result, the finger of the adjustable driving collar (10), which is fastened to the turntable hub, engages a projection on the brass pinion. This sets the pinion (15) and the cam (57) in rotation. A single revolution of the main cam performs all of the required change cycle function.

As the main cam rotates, the pin of the sweep lever (40) rides up the incline and into the groove of the cam. This action raises the tone arm and swings it out to clear the record. At this point of cam rotation, the 10-inch and 12-inch indexing is determined. This is accomplished by means of the frog (57A) of the main cam, which is moved from one side to another by the 10-inch actuating lever (51). When the record support is in the 10-inch position, the actuating lever is lowered; therefore, as the cam rotates, the pin of the frog comes in contact with the lever and is moved away from the spindle, setting the indexing track for 10-inch positioning.

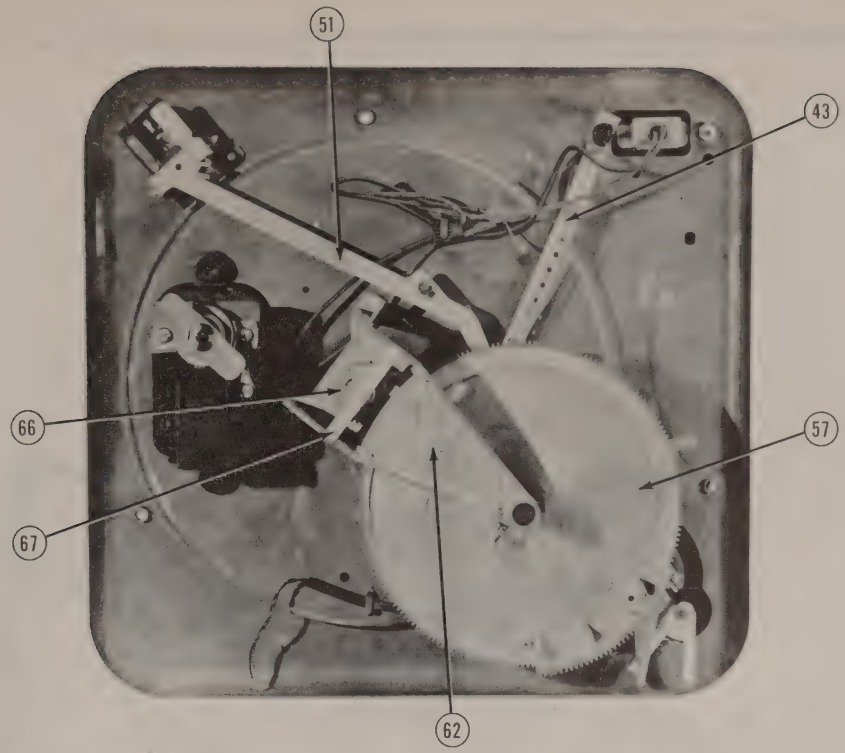

FIG. 3—BOTTOM VIEW

The spring-loaded actuating lever (61) is automatically reset with the trip actuator (58) by the cam (62A) of the positioning bracket (62).

The extended section of teeth of the main cam now engages and rotates the pinion (66), which, in turn, rotates the eccentric assembly (56), thus selecting and dropping a record to the turntable. After the record has been dropped, the wide portion on the cam moves away from the pinion. The eccentric is now aligned with the lower part of the spindle and is held in this position by a leaf spring (63), which detents into a slot in the underside of the pinion (66).

The sweep lever pin (40) now moves into the inner indexing track, moving the tone arm in and positioning it for 10-inch set down. The end of the frog is designed so that when it comes in contact with the sweep lever pin it will be pivoted inward, setting the indexing track for 12-inch positioning. This operation is repeated in each change cycle; i.e., when the record support is in the 10-inch position. However, when the record support is in the 12-inch position the actuating lever (5) is raised above the frog, keeping the frog in position which leads to the 12-inch track.

The sweep lever pin (40) now rides down the incline of the main cam, lowering the tone arm to the record. The washer mounted on the floating brass pinion (15) drops into a depression on the top edge of the rim of the cam, disengaging it from the driving collar (10). The main cam is now held in this position by the ground spring (39). This completes the change cycle.

Velocity Trip

The velocity trip assembly (41) is composed of three parts: The "V" lever (A), the trip lever (B), and the velocity trip actuator (C). The "V" lever and the trip lever work on a friction clutch. As the tone arm moves toward the center of the record, the sickle-shaped portion of the sweep lever (40) comes into contact with one leg of the "V" lever, causing the trip lever to move toward the spindle. This inward movement of the trip assembly continues until the tip of the trip lever (B) is in range of the finger on the adjustable collar (15). Once this position is attained, and as long as the movement of the needle toward the spindle is less than $\frac{1}{8}$" per revolution, the tip of the trip lever will be pushed away from the spindle. This means that the friction clutch slips a corresponding amount; however, when the needle moves into the fast lead-in groove, the trip lever moves in rapidly allowing the velocity trip actuator (C) to slide off the flat surface of the cam trip actuator (58). As a result, the next revolution of the collar (10) will force the trip lever outward causing the crescent lever to pull against the trip actuator enough to unlatch the actuating pinion lever (61), thus starting a change cycle.

ADJUSTMENTS

Tone Arm Set-Down Point

In early production the set-down point was adjusted by means of two adjusting screws in the bottom cam (27). These screws contact a flat on the pickup arm support rod (27A) in such a manner as to cause the bottom cam to turn when the set screws are turned in and out. To move the set-down position, loosen one screw and tighten the other until the correct position is obtained. Make certain that both screws are tightened after the adjustment has been completed.

In late production the changer has an eccentric pin (18) in tone arm and the bottom cam (27) is press fitted to the

A PHOTOFACT "EXPLODED" VIEW

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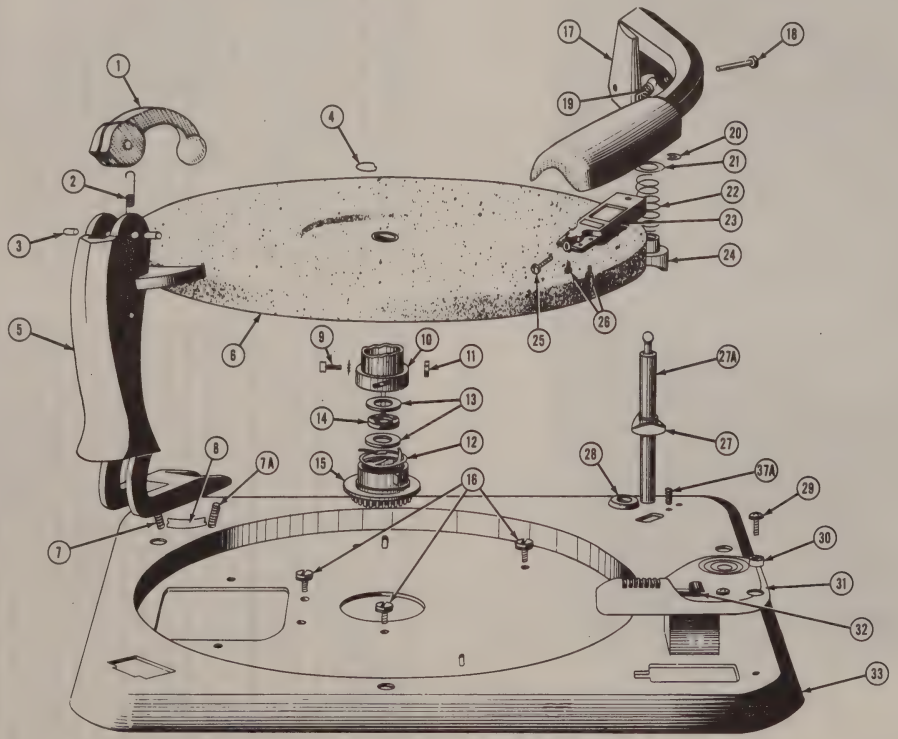

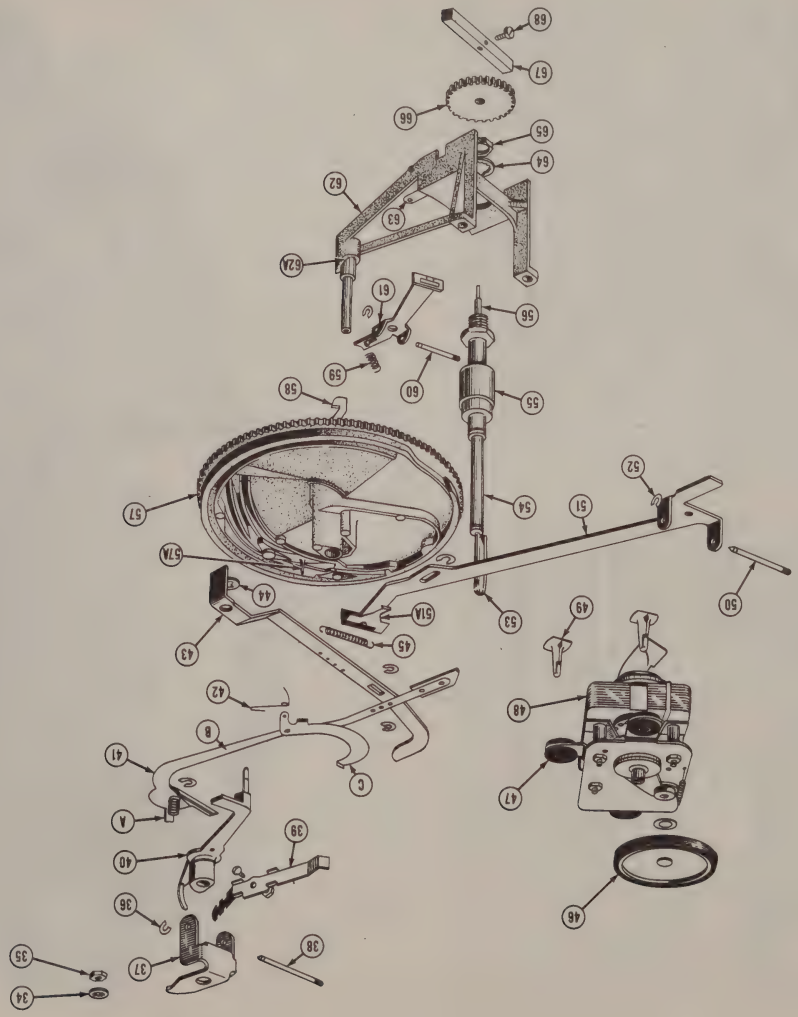
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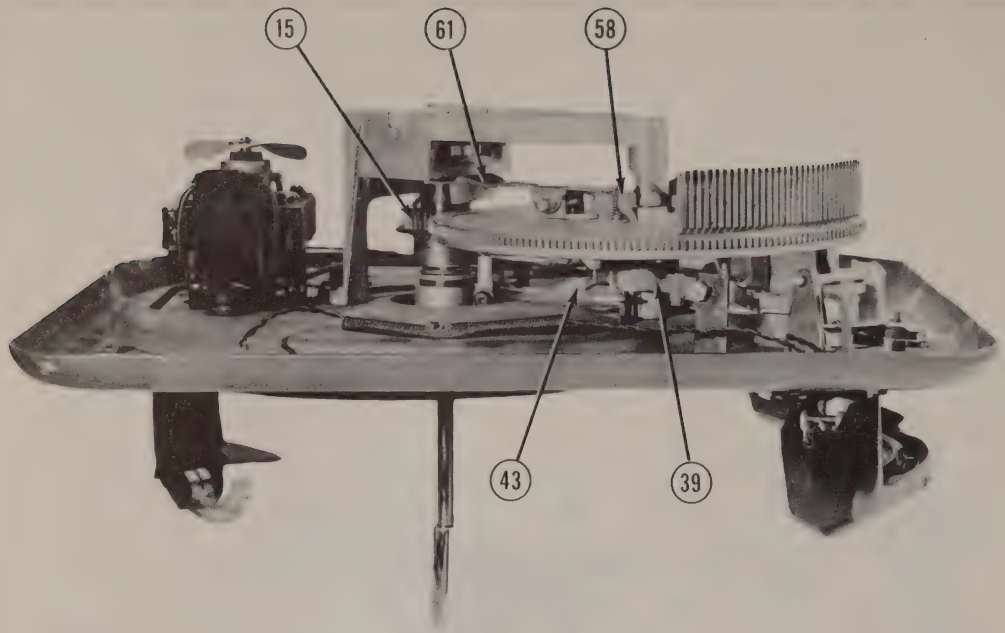

FIG. 4—BACK VIEW

support rod (27A). To check the adjustment, place a 10-inch record on the turntable, move the record support to the 10-inch position and turn the changer on. Observe the landing of the tone arm on the record. By turning the eccentric pin (18), it gives the pickup arm a small horizontal movement. However, if a large adjustment is necessary, due to the looseness of the set screw in the sweep lever (40), the following adjustment is necessary. Remove the power plug, trip the changer by pulling on the switch plate (31). Rotate the turntable in a clockwise direction until the tone arm starts to drop to the record. At this point the sweep lever (40) is securely held by the 10-inch index groove in the main cam. Loosen the set screw so the support rod (27A) is free to turn. Move the tone arm over the starting groove of the record and hold it in this position while tightening the set screw. A minor adjustment may now be made by the eccentric pin (18).

Tone Arm Height

When the tone arm is in proper adjustment the needle should clear a stack of twelve 10-inch records. To vary the height of the tone arm, on units of early production, loosen the set screw in the sweep lever (40) and raise the shaft (27A). If a large adjustment is necessary it will probably be found that the lift and sweep lever assembly (40) is bent out of shape.

In later models the tone arm support (27A) has been modified to permit bending of the ball tip for adjustment of tone arm height. Bending the ball forward brings the tone arm down, while bending the ball back lifts the tone arm.

If the tone arm is set too high to play the first record, turn the set screw (37A), which is located directly behind the tone arm in the base plate, in a counterclockwise direction to lower the arm.

Record Support Adjustment

Correct adjustment of the record support (5) is, when a record is aligned with the lower part of the spindle (54) the edge of the record should clear the record support (5) by approximately 1/64", i.e., with the record support in the correct position for the size of record to be played. To vary the clearance for 10-inch records, adjust set screw (7), located on the bottom of the record support; for 12-inch records, adjust screw (7A).

Spindle Alignment

The eccentric cam (56) should be aligned with the lower part of the spindle (54) when the changer is out of cycle. To adjust, rotate the pinion (66) until the detent spring (63) engages the detent in the pinion, loosen the set screws in the pinion, align the eccentric (56) with the spindle (54), and tighten the set screws.

The spindle cap (53) should be in a position so that the slide is facing the center of the record support (5). To align the spindle cap, loosen the set screw (68), turn the spindle cap to its correct position, and tighten the set screw. There should be approximately .005" total vertical play in the spindle assembly to prevent binding.

Ten-Inch and Twelve-Inch Indexing Adjustment

When the record support (5) is in the 12-inch position, the spring plate on the end of the actuating lever (51) is elevated so that it clears frog (57A) by approximately 1/16 inch, leaving it in an inward position. When the record support is in the 10-inch position, the spring plate on the actuating lever is in a lowered position, thereby moving the frog outward as it comes in contact with the spring.

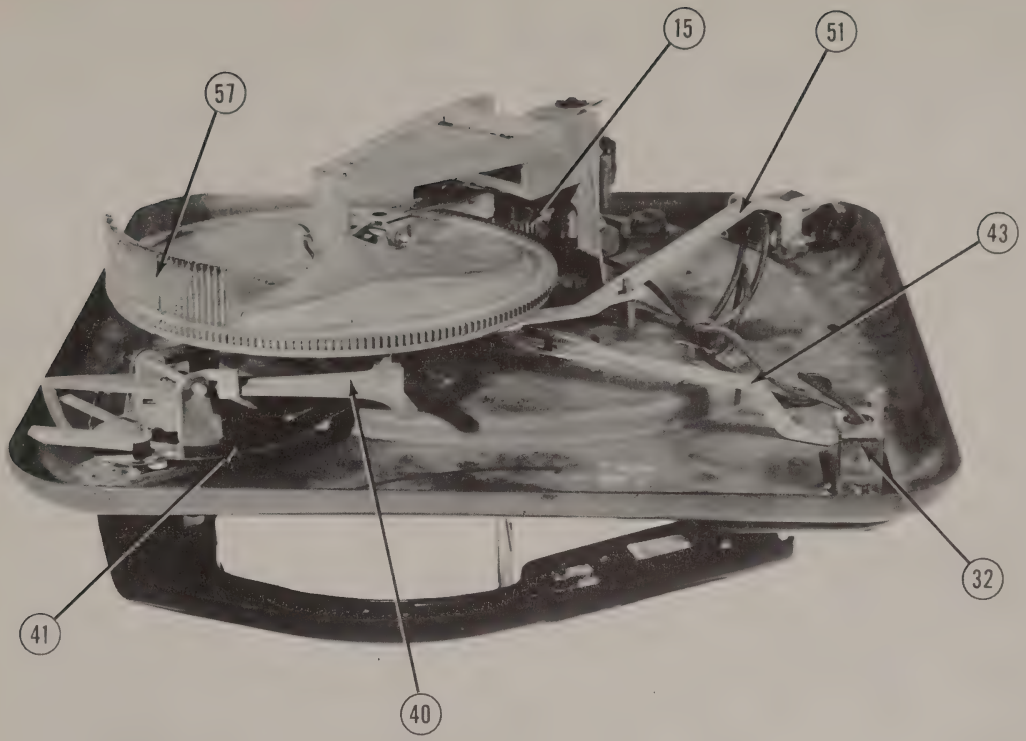

FIG. 5—SIDE VIEW

The frog is so constructed that it will be reset in the 12-inch position each time the sweep lever pin goes past it. If necessary, the plate should be bent into the correct position to meet these requirements.

TROUBLES

Records Do Not Drop to Turntable When Changer Cycles

1. Check the thickness of the record.
2. Spindle out of alignment. See "Spindle Alignment" under Adjustments.
3. Check the record support for proper adjustment See "Record Support Adjustment."
4. Pinion (66) may be loose on the eccentric shaft (56).

Two Records Drop at a Time

1. Check the thickness of the records. They should not be less than .070" at the center hole.
2. Check the slide in the spindle cap (53) for binding. The slide, when fully lowered, prevents more than one record from being dropped to the turntable. If slide is in a raised position during cycling, several records may drop at once.
3. Check the record support adjustment.

Failure to Trip

1. Spring (42) on the trip assembly (41) loose.
2. Velocity trip actuator (C) of the trip assembly (41) binding in an outward position. If this is so, the cam trip actuator (58) will not be moved when the velocity trip lever is actuated by the adjustable collar (10).
3. By moving the "V" lever (A), check the trip assembly (41) to see if it rotates freely and does not bind on the reject trip lever (43) or base plate. The friction clutch should not slip when the trip lever moves over its free path.
4. Check between drive pinion (15) and lower bearing sleeve (55) for grit. Drive pinion must slide freely on lower bearing sleeve.
5. Check the leg of the adjustable collar (10). Collar should be adjusted so that leg engages projection on drive pinion by at least 1/32".

Continuous Tripping

1. Check the leg on the adjustable collar (10). It should clear the drive pinion (15) by approximately 1/32", i.e., when the fiber disc on the drive pinion is resting in the cutout in the main cam.
2. Check spring (12) to see if it is pushing the pinion down as the main cam returns to home position.
3. Check the velocity trip assembly (41) for binding.
4. Check the reject trip lever (43) for binding.
5. Check the changer to see if it is level. A tilted changer may cause it to trip continuously.
6. Check the pinion (15) for binding.

LUBRICATION

Factory lubrication should be sufficient for a long period of service; however, if it becomes necessary to lubricate, do so as follows:

Use light machine oil in all moving parts (where necessary), except the turntable shaft and pinion (15), main cam (57), and the eccentric pinion (66).

Use a good light grease on the turntable shaft and pinion (15); the cam tracks; frog (57A); teeth of the main cam (57); and the detent of the pinion (66).

PARTS LIST

Ref. No.	Part No.	DESCRIPTION
1	55-73613	Record stabilizer finger
2	33-73349	Spring
3	12-74596	Stud
4	33-73610	Clip
5	62-74535	Record support
6	66A75025	Turntable assembly
7	2087S	Set screw
7A	2087S	Set screw
8	33-74543	Spring-lock
9	9214	Screw
10	65-73595	Driving Collar
11	1022-A	Nut
12	33-75452	Pinion spring
13	32-72485	Washer
14	30A72491	Thrust bearing assembly
15	28A73704	Pinion assembly
16	1333-A	Screw
17	69-73657	Tone arm
18	12-75361	Eccentric pivot pin
19	33-74053	Spring
20	32-18893	"C" washer
21	32-74055	Washer
22	33-73340	Spring
23	Per Order	Pickup cartridge
24	43-73113	Tone arm top cam
25		Needle screw
26	1338-A	Pickup mounting screw
27	43-73069	Tone arm bottom cam
27A	12-72975	Tone arm support
28	37-73772	Grommet
29	1399Y	Screw
30	65-73144	Sleeve
31	10-74368	Switch plate
32	58-73096	Switch
33	57A74568	Motorboard assembly
34	1906-C	Lockwasher
35	1022-A	Nut
36	32-16901	"C" washer
37	10-73132	Tone arm hinge bracket
37A	2073-S	Screw
38	12-73007	Pin
39	33-72963	Ground spring
40	55A73045	Lift and sweep lever assembly
41	55A74635	Velocity trip assembly
42	33-75158	Crescent spring
43	55-73102	Reject trip lever
44	1201-A	Speed nut
45	33-71342	Spring
46		Idler wheel (part of item 48)
47		Motor mounting grommet
48	56-73555	Motor
49	37-73031	Snap fastener
50	12-73007	Pin
51	55-A74605	10" frog actuating lever assembly (including item 51A)
51A	33-74602	Spring
52	32-16901	"C" washer
53	21A73601	Spindle cap assembly
54	19A75358	Spindle assembly
55	65-75007	Lower bearing sleeve
56	43A72960	Eccentric assembly
57	43A75235	Cam and frog assembly
58	55-75142	Cam trip actuator
	33-75136	Cam actuator spring
59	33-73577	Spring
60	12-73568	Actuating lever pin
61	55A74813	Actuating lever assembly
62	10A75238	Positioning bracket subassembly
63	33-73135	Detent spring
64	1932-C	Lockwasher
65	1042-A	Nut
66	28-73084	Pinion
67	32-73301	Spindle cap rod retainer
68	1344-A	Screw

PHOTOFACT* Folder

PHILCO MODELS
48-2500, 48-2500-5

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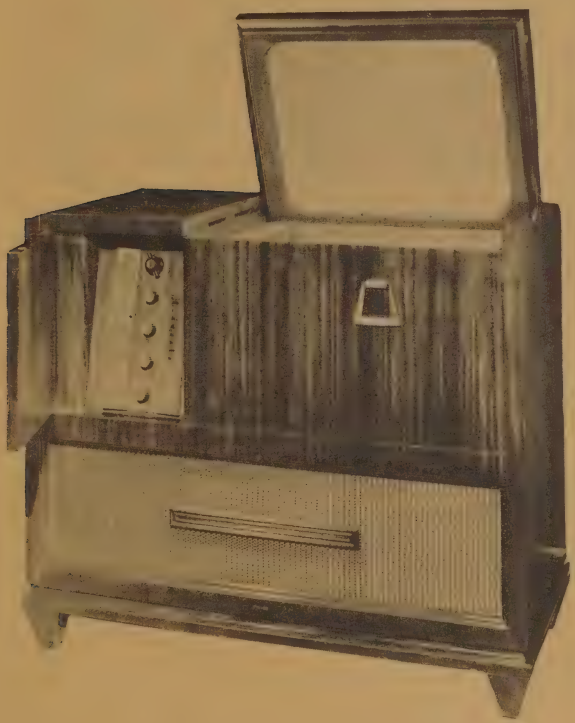

MODEL 48-2500

PHILCO MODELS
48-2500, 48-2500-5

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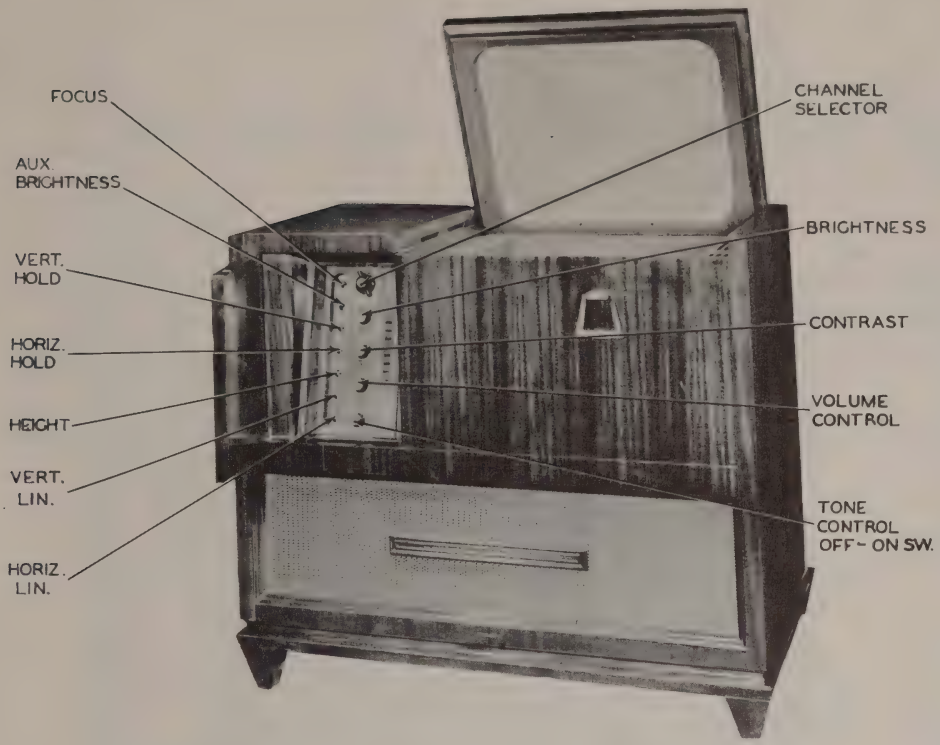

PHILCO MODEL 48-2500

TRADE NAME	Philco, Models 48-2500, 48-2500-5 (Codes 121 and 122)
MANUFACTURER	Philco Corp., Tioga and "C" Sts., Philadelphia, Pa.
TYPE SET	Projection Type Television Receiver
TUBES	Twenty Nine

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 2.6 Amp. @ 117 Volts AC
TUNING RANGE—Any Eight Channels of Channels 2 thru 13

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PHILCO MODELS 48-2500, 48-2500-5 (Codes 121 and 122)

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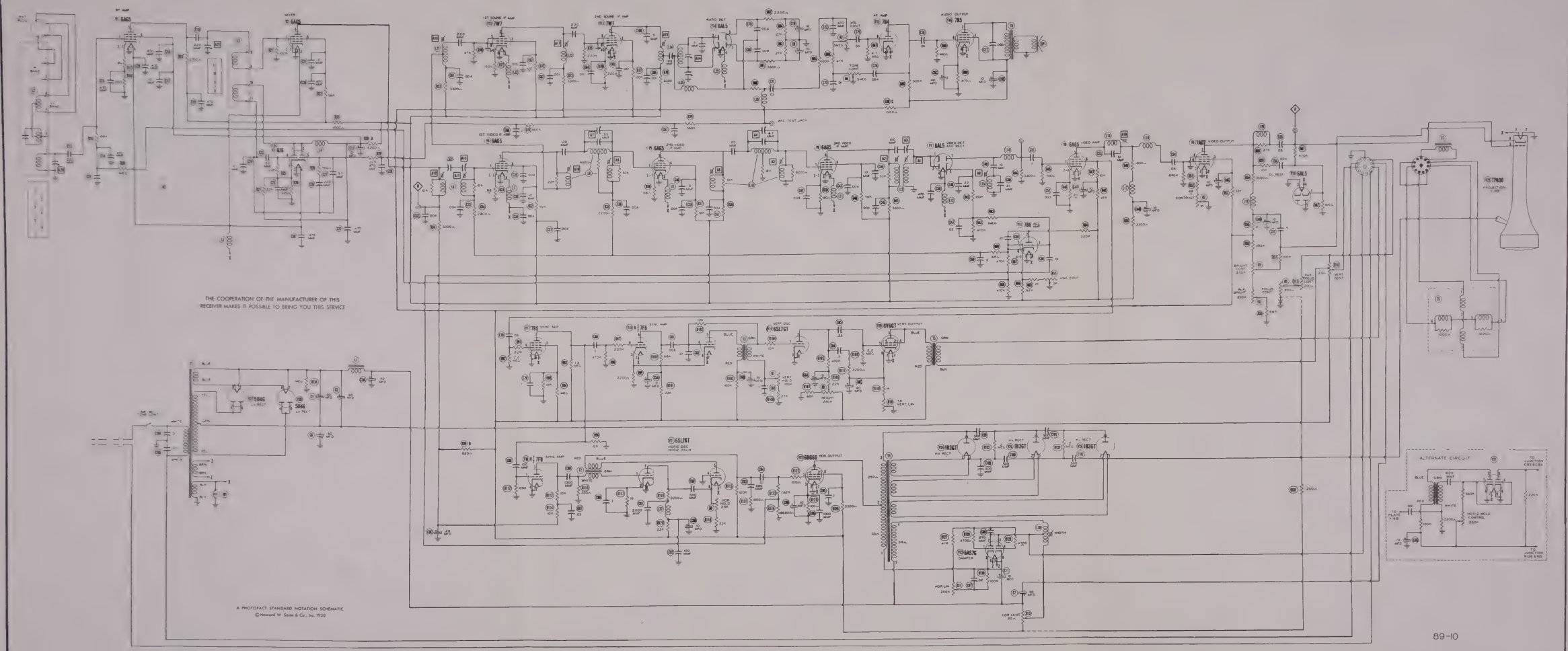
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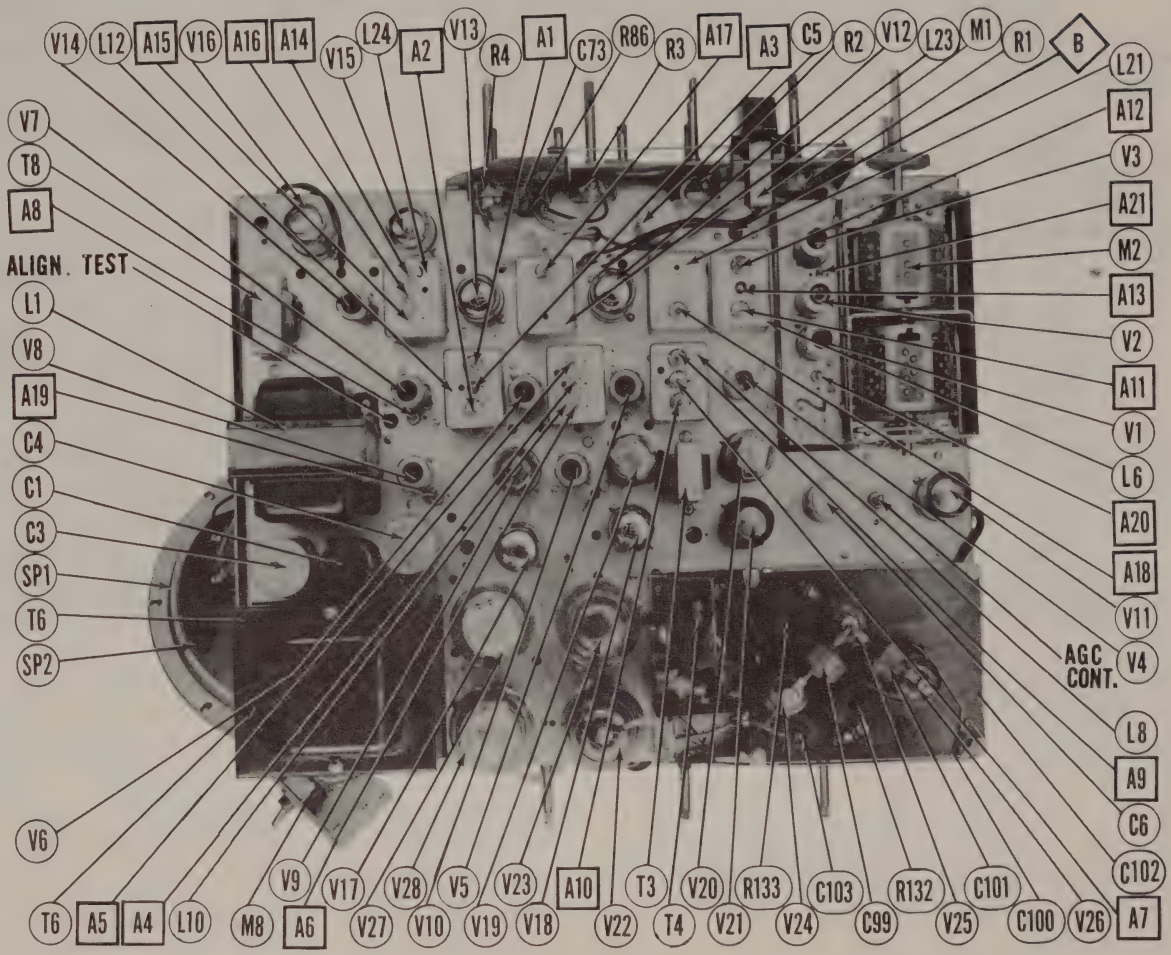
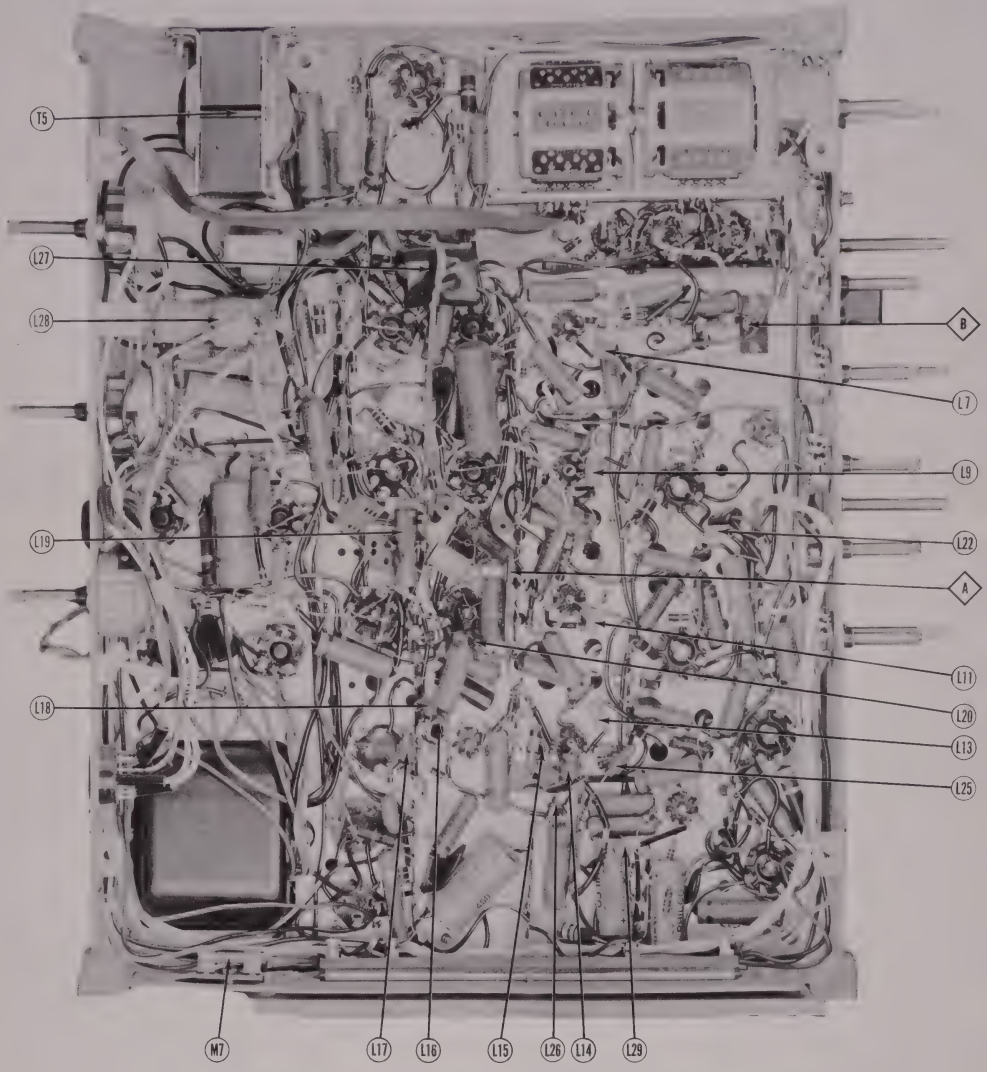
ALTERNATE CIRCUIT

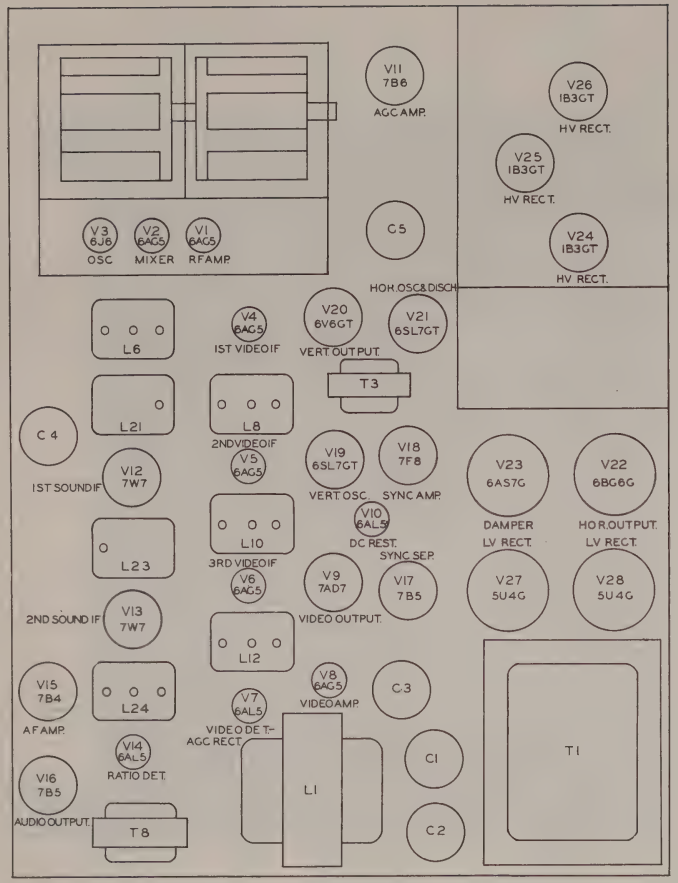


CHASSIS TOP VIEW

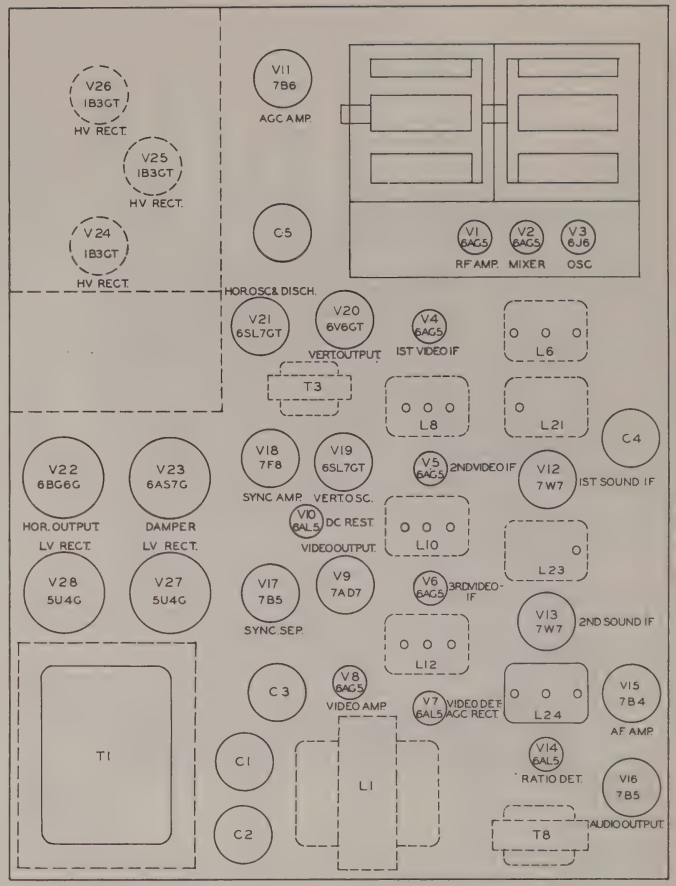


CHASSIS BOTTOM VIEW-TRANS.,INDUCTOR AND ALIGNMENT IDENTIFICATION

PHILCO MODELS 48-2500, 48-2500-5 (Codes 121 and 122)



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

VIDEO IF ALIGNMENT

High voltage may be disabled during the alignment procedure by removing the horizontal oscillator (V21). All signal generator leads must be shielded. The unshielded termination of the lead must be as short as possible and the shield should be connected to the receiver chassis at the closest possible point to the hot lead. The signal generator lead should be terminated with a shunt resistor equal to the output impedance of the generator.

The speaker and deflection yoke must be connected at all times when the receiver is in operation. If the yoke is not used, both sweep generator tubes (V21 and V19) must be removed. If the speaker is not used, the audio output tube (V16) must be removed.

The signal generator output must be kept low enough at all times to prevent overload. Use insulated alignment screwdriver for adjustments.

The receiver should be allowed to warm up for at least 20 minutes before alignment is attempted.

When used with the sweep generator, the marker oscillator should be connect through a small capacitor, about 10MFD. When used alone, couple direct.

When connecting signal generator to mixer grid, the shield grounding will be critical. Try adding additional grounds until no change in pattern is noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	5000MMF	Pin #1 (Grid) of 6AG5 (V6).	25MC (8MC SWP)	27.1MC (Unmod.)	Any	High side to "align test" jack through 10K ohms. Low side to chassis.	A1, A2	Set A3 fully counterclockwise for narrow peak pattern. Adjust A1 and A2 for maximum amplitude with marker at peak of curve. See Fig 1.
2.	5000MMF	"	"	23.1MC (Unmod.)	"	"	A3	Adjust for pattern approx. Fig 2. Slight readjustment of A1 and A2 may be necessary.
3.	5000MMF	Pin #1 (Grid) of 6AG5 (V5).	Not used	28.1MC (Mod. 400~)	"	"	A4	Adjust for minimum amplitude. Increase output of marker generator for more accurate indication.
4.	5000MMF	"	25MC (8MC SWP)	23.75 & 26.6MC (Unmod.)	"	"	A5, A6	Adjust for pattern approximating Fig 3. A5 should be adjusted at 26.6MC and A6 at 23.75MC.
5.	5000MMF	Pin #1 (Grid) of 6AG5 (V4).	Not used	22.1MC (Mod. 400~)	"	"	A7, A8	Adjust for minimum amplitude.
6.	5000MMF	"	25MC (8MC SWP)	See Fig. 4	"	"	A9, A10	Adjust for pattern approximating Fig 4.
7.	5000MMF	Pin #1 (Grid) of mixer (V2).	"	See Fig. 5	"	"	A11, A12, A13	Adjust for pattern approximating Fig 5. A13 controls band width. SLIGHT readjustments of A5, A6, A9, and A10 may be made if necessary.

SOUND IF ALIGNMENT

A20 and A21 are factory preset to compensate for different wiring capacitances. Readjustment should never be necessary unless tubes or component parts in the tuner changed. If it does become necessary to adjust these trimmers they should be adjusted at the highest frequency channel normally used. Connect an oscilloscope to Point B through a detector probe and isolating capacitor. With a sweep signal generator adjusted to sweep through the desired channel, adjust A20 and A21 for symmetrical response through the channel.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	5000MMF	Pin #6 (Grid) of 7W7 (V13).	22.1MC (2MC SWP)	22.1MC (Unmod.)	Any	High side thru 10KΩ resistor to "AFC test" jack. Low side to chassis.		Crossover should be at 22.1MC. Move marker to 21.8MC for lower peak and to 22.4MC for upper peak. Be sure pattern is such that frequencies below 22.1MC gives negative output. If discriminator is properly aligned as shown in Fig 6. Steps 9 and 10 may be omitted.
9.	5000MMF	"	"	"	"	"	A14	Adjust for crossover at 22.1MC.
10.	5000MMF	"	"	21.8MC & 22.4MC	"	"	A15, A16	Adjust for symmetrical peaks at 21.8MC and 22.4MC. A15 affects the amplitude and straightness of diagonal line. A16 affects the slope of the diagonal line.
11.	5000MMF	Pin #6 (Grid) of 7W7 (V12).	"	"	"	"	A17	Adjust for maximum amplitude with symmetrical peaks.
12.	5000MMF	Pin #1 (Grid) of 6AG5 (V4).	"	"	"	"	A18	"
13.	5000MMF	Pin #1 (Grid) of mixer (V2).	"	22.1MC	"	"	A17, A18	If discriminator peaks are unequal, A17 & A18 may be readjusted slightly to equalize the peaks.
14.	Direct	Pin #1 (Grid) of 6AG5 (V8).		4.5MC (Unmod.)	"	High side to Point (A) Low side to chassis.	A19	Adjust for minimum. If wide band scope is not available, VTVM with AC probe may be used.

OSCILLATOR ADJUSTMENT

With the channel selector switch set to the desired channel, remove the knob and insert a screwdriver through the hole to reach the oscillator adjustment. Adjust for best sound, or preferably for zero voltage at the AFC test jack.

AGC ADJUSTMENT

With a calibrated oscilloscope connected to the "align test" jack, and a signal being received, adjust the AGC control for a 2 volt peak-to-peak signal on the scope.

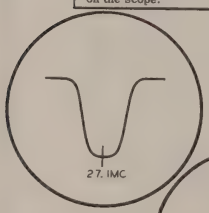


FIG.1

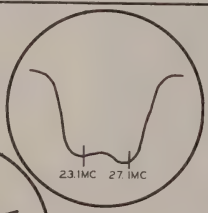


FIG. 2

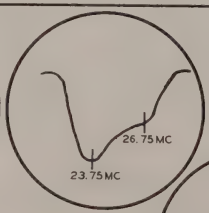


FIG.3

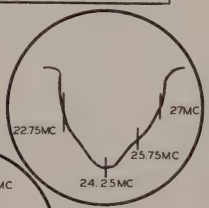


FIG.4

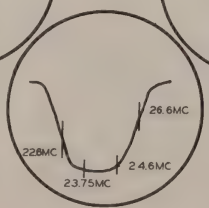


FIG. 5

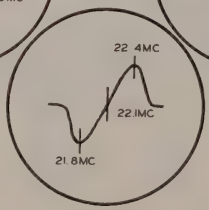
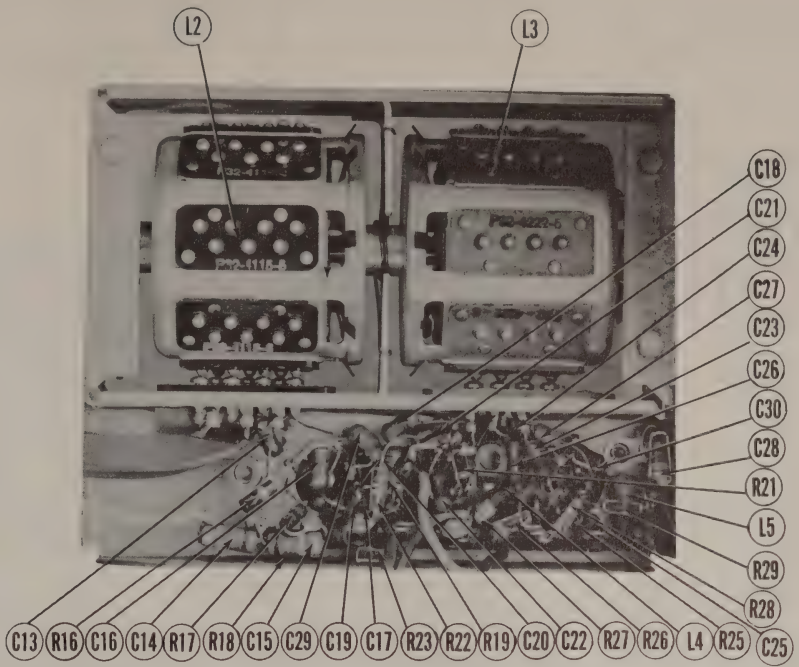
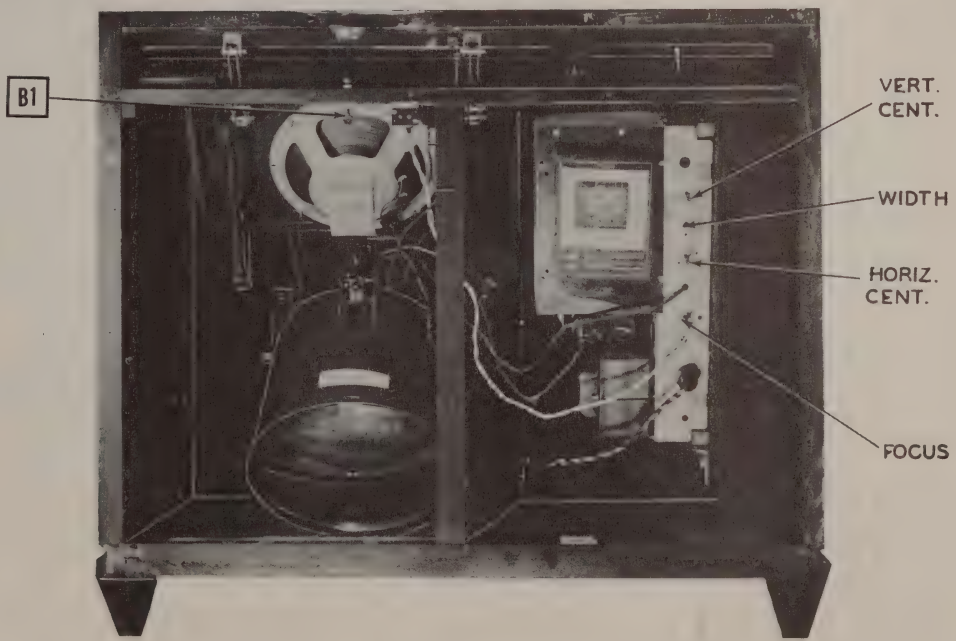


FIG. 6



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	0V.	1.5VDC	0V.	6.3VAC	270VDC	135VDC	1.5VDC		
V 2	6AG5	-2.5VDC	0V.	6.3VAC	0V.	240VDC	165VDC	0V.		
V 3	6J6	135VDC	135VDC	0V.	6.3VAC	§-2VDC	§1VDC	4VDC		
V 4	6AG5	0V.	.8VDC	0V.	6.3VAC	230VDC	125VDC	.8VDC		
V 5	6AG5	0V.	.7VDC	0V.	6.3VAC	230VDC	125VDC	.7VDC		
V 6	6AG5	0V.	1.2VDC	0V.	6.3VAC	230VDC	110VDC	1.2VDC		
V 7	6AL5	0V.	0V.	6.3VAC	0V.	.6VDC	0V.	-.2VDC		
V 8	6AG5	0V.	1.4VDC	0V.	6.3VAC	215VDC	130VDC	1.4VDC		
V 9	7AD7	0V.	310VDC	270VDC	0V.	0V.	0V.	11VDC	6.3VAC	
V 10	6AL5	.4VDC	0V.	0V.	6.3VAC	0V.	0V.	0V.		
V 11	7B6	0V.	250VDC	.1VDC	4.2VDC 18VDC	0V.	0V.	4.2VDC 18VDC	6.3VAC	
V 12	7W7	6.3VAC	250VDC	85VDC	1VDC	0V.	0V.	1VDC	0V.	
V 13	7W7	6.3VAC	250VDC	60VDC	1.1VDC	0V.	0V.	1.1VDC	0V.	
V 14	6AL5	0V.	.1VDC	0V.	6.3VAC	.5VDC	0V.	-.4VDC		
V 15	7B4	0V.	93VDC	0V.	0V.	0V.	-.4VDC	0V.	6.3VAC	
V 16	7B5	6.3VAC	280VDC	297VDC	0V.	0V.	0V.	18VDC	0V.	
V 17	7B5	6.3VAC	1.9VDC	2.9VDC	0V.	350VDC	-.6VDC	0V.	0V.	
V 18	7F8	-.2VDC	6.3VAC	150VDC	0V.	5.7VDC	175VDC	0V.	0V.	
V 19	6SL7GT	-20VDC	9VDC 40VDC	0V.	-19VDC	280VDC	5.7VDC	6.3VAC	0V.	
V 20	6V6GT	0V.	6.3VAC	330VDC	330VDC	0V.	0V.	0V.	23VDC 33VDC	
V 21	6SL7GT	-.3VDC	270VDC	4.4VDC	0V.	200VDC	80VDC	6.3VAC	0V.	
V 22	6BG6G	0V.	0V.	10VDC	0V.	-4.8VDC	0V.	6.3VAC	300VDC	TOP CAP *
V 23	6AS7G	290VDC 320VDC	350VDC	370VDC	290VDC 320VDC	350VDC	370VDC	370VDC	370VDC	
V 24	1B3GT	* DO NOT MEASURE.								
V 25	1B3GT	* DO NOT MEASURE.								
V 26	1B3GT	* DO NOT MEASURE.								
V 27	5U4G	0V.	370VDC	0V.	340VAC	0V.	340VAC	0V.	370VDC	
V 28	5U4G	0V.	370VDC	0V.	340VAC	0V.	340VAC	0V.	370VDC	
V 29	TP400	0V.	0V.	0V.	0V.	.2VDC	0V.	6.3VAC	168VDC	

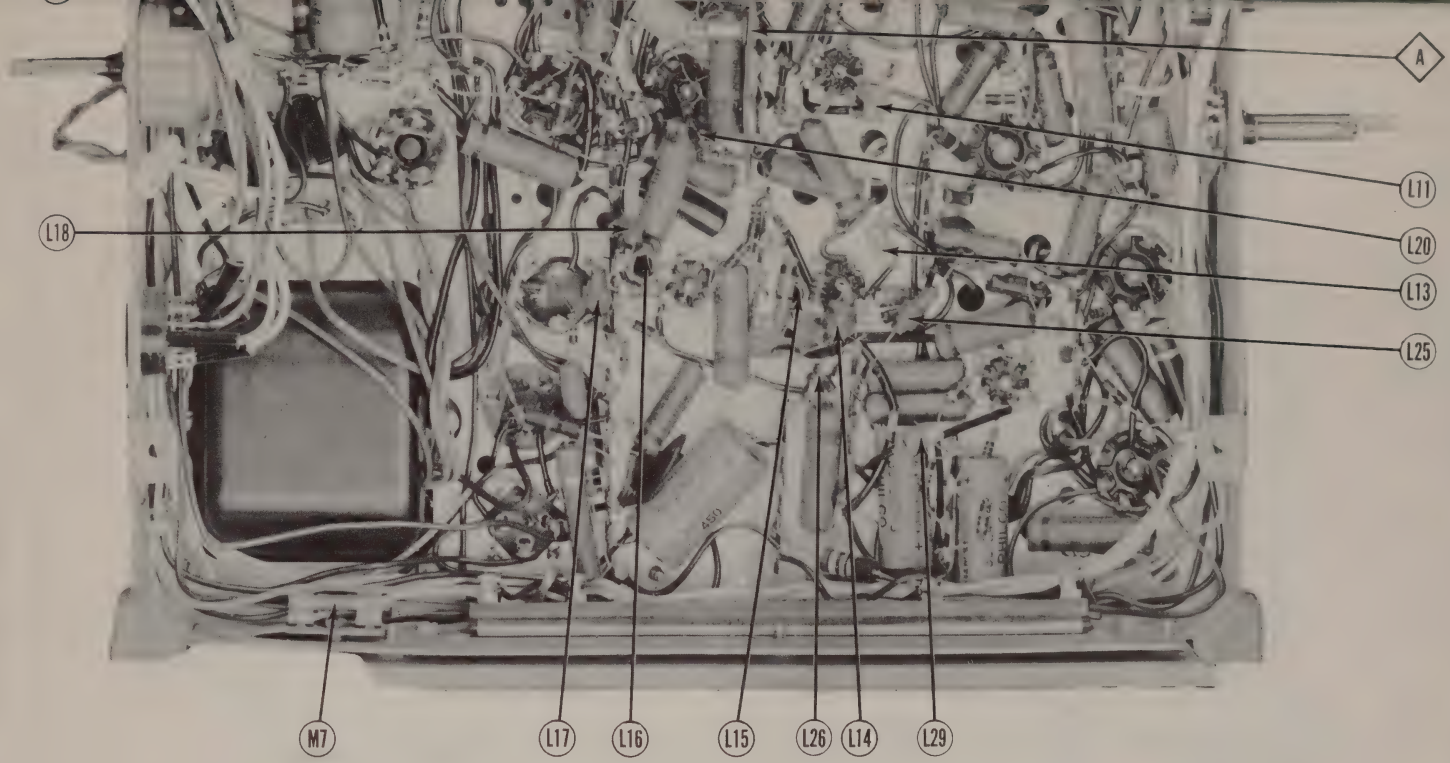
§ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.
NOTE: AUTOMATIC LEVEL CONTROL SET IN MAXIMUM CLOCKWISE POSITION FRO THESE MEASUREMENTS.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	1.5 Meg.	168Ω	0Ω	.1Ω	†4.5KΩ	†6.5KΩ	168Ω		
V 2	6AG5	100KΩ	0Ω	.1Ω	.0Ω	†4KΩ	†57KΩ	0Ω		
V 3	6J6	†6.5KΩ	†6.5KΩ	0Ω	.1Ω	Inf.	22KΩ	220Ω		
V 4	6AG5	2 Meg.	68Ω	0Ω	.1Ω	†4.2KΩ	†56KΩ	68Ω		
V 5	6AG5	2 Meg.	68Ω	0Ω	.1Ω	†4.2KΩ	†56KΩ	68Ω		
V 6	6AG5	.2Ω	180Ω	0Ω	.1Ω	†4.2KΩ	†56KΩ	180Ω		
V 7	6AL5	.2Ω	.2Ω	.1Ω	0Ω	650KΩ	Inf.	3.3KΩ		
V 8	6AG5	1 Meg.	120Ω	0Ω	.1Ω	†6KΩ	†57KΩ	120Ω		
V 9	7AD7	0Ω	†4.5KΩ	†33KΩ	0Ω	0Ω	820KΩ	100Ω	.1Ω	
V 10	6AL5	1 Meg.	Inf.	0Ω	.1Ω	Inf.	Inf.	0Ω		
V 11	7B6	0Ω	†220KΩ	1.5 Meg.	5000Ω 1000Ω	940KΩ	940KΩ	5000Ω 1000Ω	.1Ω	
V 12	7W7	.1Ω	†4.2KΩ	†100KΩ	150Ω	0Ω	47KΩ	150Ω	0Ω	
V 13	7W7	.1Ω	†4.2KΩ	†100KΩ	220Ω	0Ω	220KΩ	220Ω	0Ω	
V 14	6AL5	Inf.	Inf.	0Ω	.1Ω	30KΩ	Inf.	30KΩ		
V 15	7B4	0Ω	†330KΩ	Inf.	Inf.	Inf.	4.7 Meg.	0Ω	.1Ω	
V 16	7B5	.1Ω	†2KΩ	†1.5KΩ	Inf.	Inf.	1 Meg.	470Ω	0Ω	
V 17	7B5	.1Ω	†30KΩ	†30KΩ	Inf.	†90Ω	2.2 Meg.	0Ω	0Ω	
V 18	7F8	100KΩ	.1Ω	†20KΩ	0Ω	2.2KΩ	†90KΩ	0Ω	800KΩ	
V 19	6SL7GT	38KΩ	†600KΩ †500KΩ	0Ω	38KΩ	†100KΩ	2.2KΩ	.1Ω	0Ω	
V 20	6V6GT	Inf.	.1Ω	†700Ω	†700Ω	2.2 Meg.	Inf.	0Ω	6KΩ 1000Ω	
V 21	6SL7GT	330Ω	†24KΩ	1000Ω	0Ω	†180KΩ	58KΩ	.1Ω	0Ω	
V 22	6BG6G	Inf.	0Ω	100Ω	Inf.	88KΩ	Inf.	.1Ω	†3.3KΩ	TOP CAP #32Ω
V 23	6AS7G	#450KΩ #200KΩ	†85Ω	300KΩ	#450KΩ #200KΩ	†85Ω	300KΩ	300KΩ	300KΩ	
V 24	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #270Ω
V 25	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP Inf.
V 26	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP Inf.
V 27	5U4G	Inf.	20KΩ	Inf.	80Ω	Inf.	80Ω	Inf.	20KΩ	
V 28	5U4G	Inf.	20KΩ	Inf.	80Ω	Inf.	80Ω	Inf.	20KΩ	
V 29	TP400	Inf.	0Ω	Inf.	Inf.	1.5 Meg.	Inf.	.1Ω	330KΩ	

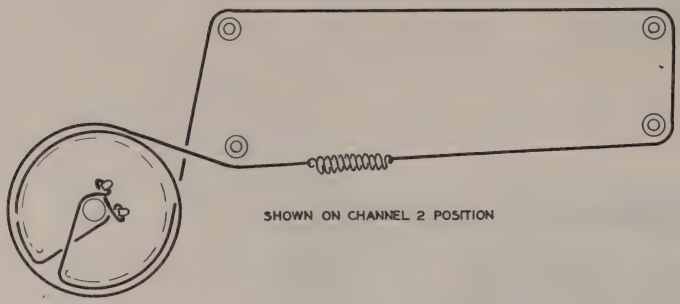
† MEASURED FROM PIN 2 OF V28.
# MEASURED FROM PIN 3 OF V23.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



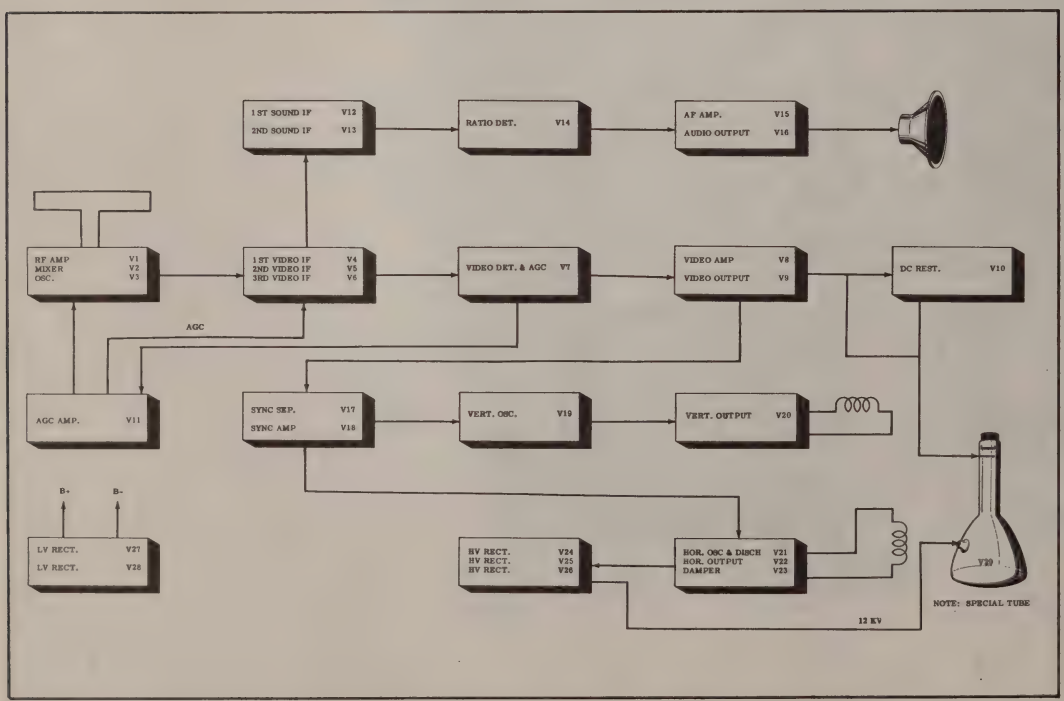
CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

CHANNEL SELECTOR DRIVE CORD STRINGING

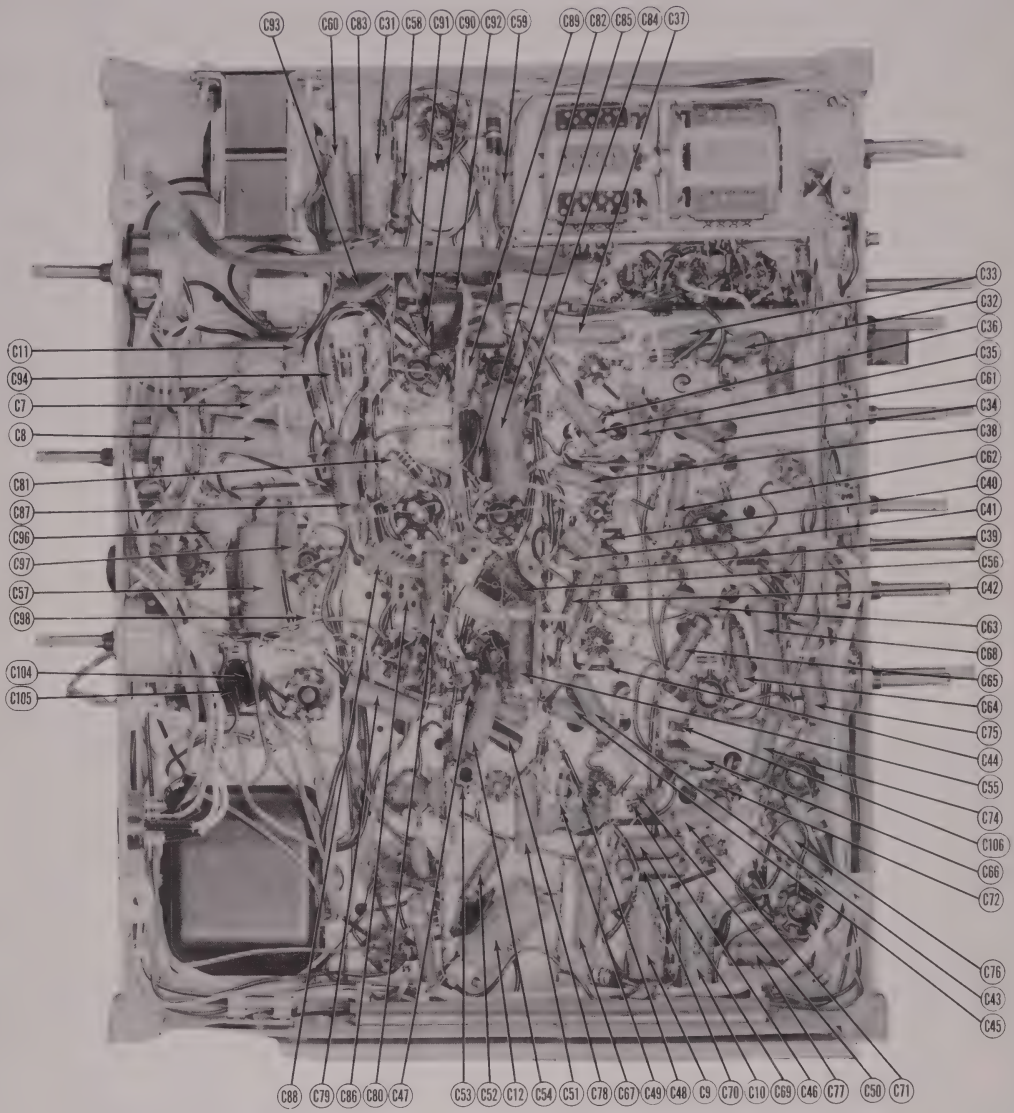


DISASSEMBLY INSTRUCTIONS

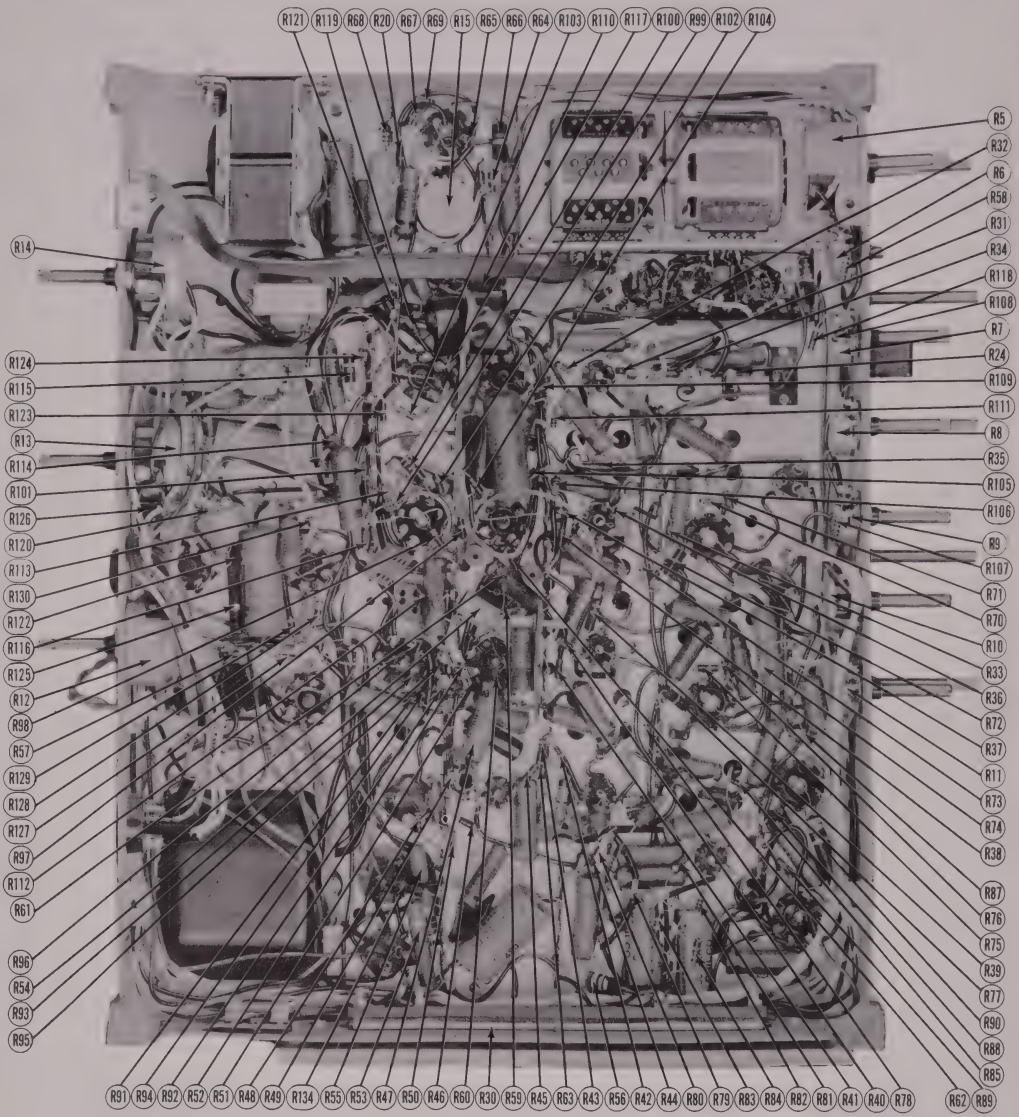
1. Remove five push-on type control knobs.
2. Remove twenty-five phillips head screws holding rear cover. Remove cover.
3. Remove speaker plug.
4. Remove yoke plug.
5. Remove picture tube base socket.
6. Remove HV lead from picture tube. (Do this with moderate pull on lead close to projection tube assembly).
7. Remove power interlock plug from socket on cabinet.
8. Remove six 5/16" hex head bolts holding TV chassis. Remove chassis.
9. Remove four 5/16" hex nuts holding speaker. Remove speaker.
10. Remove four 7/16" hex nuts holding projection tube assembly. Remove assembly.



BLOCK DIAGRAM



CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PHILCO MODELS 48-2500, 48-2500-5 (Codes 121 and 122)

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		PHILCO PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6AG5	6AG5	7BD	
V2	Mixer	6AG5	6AG5	7BD	
V3	Osc.	6J6	6J6	7BF	
V4	1st video IF Amp.	6AG5	6AG5	7BD	
V5	2nd Video IF Amp.	6AG5	6AG5	7BD	
V6	3rd Video IF Amp.	6AG5	6AG5	7BD	
V7	Video DET.– AGC Rectifier	6AL5	6AL5	6BT	
V8	Video Amp.	6AG5	6AG5	7BD	
V9	Video Output	7AD7	7AD7	8V	
V10	DC Restorer	6AL5	6AL5	6BT	
V11	AGC Amp.	7B6	7B6	8W	
V12	1st Sound IF Amp.	7W7	7W7	8BJ	
V13	2nd Sound IF Amp.	7W7	7W7	8BJ	
V14	Ratio DET.	6AL5	6AL5	6BT	
V15	AF Amp.	7B4	7B4	5AC	
V16	Audio Output	7B5	7B5	6AE	
V17	Sync. Sep.	7B5	7B5	6AE	
V18	Sync. Amp.	7F8	7F8	8BW	
V19	Vert. Osc.	6SL7GT	6SL7GT	8BD	
V20	Vert. Output	6V6GT	6V6GT	7AC	
V21	Hor. Osc. and Disch.	6SL7GT	6SL7GT	8BD	
V22	Hor. Output	6BG6G	6BG6G	5BT	
V23	Damper	6AS7G	6AS7G	8BD	
V24	HV Rectifier	1B3GT	1B3GT	3C	
V25	HV Rectifier	1B3GT	1B3GT	3C	
V26	HV Rectifier	1B3GT	1B3GT	3C	
V27	LV Rectifier	5U4G	5U4G	5T	
V28	LV Rectifier	5U4G	5U4G	5T	
V29	Projection Tube	TP400	TP400		

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1	30	475	30-2568-19	AFN6X	UP6AJ827		TVL-7	Filter
C2	30	475	30-2568-9					Filter †
C3A	40	475	30-2570-8	AF862J4A	UP9DJ826		TVL-38	▲ Filter
B	10	475						■ Hor. Osc. Decoupling.
C	20	475						▲ Filter
D	10	25						Hor. Output Cathode Bypass
C4A	10	475	30-2570-10	AF2222X	UP7DJ825		TVL-39	▲ 1st V. screen decoupling.
B	10	475						■ 1st V. plate decoupling
C	10	475						▲ V. Output Screen Bypass.
D	10	475						V. Output Plate Decoupling.
C5A	10	450	30-2570-16	AF22J4A	UP5CJ879		TVL-52	■ Vert. Sync. Amp. Decoupling
B	10	450						▲ Decoupling
C	40	50						Output Cathode Bypass
C6A	10	450	30-2570-16	AF22J4A	UP5CJ879		TVL-52	■ Vert. Osc. Decoupling.
B	10	450						▲ Vert. Osc. Decoupling
C	40	50						Vert. Output Cath. Bypass
C7	50	25	30-2417-2	PRS 25/50	BR502A		TVA-7	Hor. Cent. Cont. Bypass.
C8	50	25	30-2417-2	PRS 25/50	BR502A		TVA-7	Bias Filter
C9	10	50	30-2417-3	PRS 250/12	BR 105		TVA-14	Stabilizing Cap.
C10	10	50	30-2417-3	PRS 250/12	BR 105		TVA-14	Stabilizing Cap.
C11	10	50	30-2417-3	PRS 250/12	BR 105		TVA-14	Damper Filter
C12	10	450	30-2417-6	PRS450/10	BR1045A		TVA-21	Decoupling
C13	220		62-122001001	GP220M		GP2K-220		RF Coupling
C14	470		62-147001001	GP470M		GP2K-470		AGC Filter
C15	470		62-147001001	GP470M		GP2K-470		RF Cathode Bypass
C16	470		62-147001001	GP470M		GP2K-470		RF Bypass
C17	10		62-010009001	GP10K		GP1K-10		RF Bypass
C18	220		62-122001001	GP220M		GP2K-220		RF Coupling
C19	470		62-147001001	GP470M		GP2K-470		Decoupling
C20	470		62-147001001	GP470M		GP2K-470		Mixer Screen Bypass
C21	10		62-010009001	GP10K		GP1K-10		Mixer Screen Bypass
C22	470		62-147001001	GP470M		GP2K-470		RF Bypass
C23	22		62-022009001	GP22K		GP1K-22		Osc. Grid Cap.
C24	10		62-010009001	CN10JN750		N750K-10		Osc. Grid Filter
C25	220		62-122001001	GP220M		GP2K-220		Osc. Cathode Bypass
C26	220		62-122001001	GP220M		GP2K-220		Phase Shifter
C27	3.3		30-1221			NPOK-3.3		Freq. Comp.
C28	470		62-147001001	GP470M		GP2K-470		AFC Filter
C29	470		62-147001001	GP470M		GP2K-470		RF Filament Bypass
C30	470		62-147001001	GP470M		GP2K-470		Osc. Filament Bypass
C31	.1	200	61-0113	P288-1	PTE4P1		TM-1	AGC Filter
C32	.004	600	61-0179	P688-004	PTE6D4	811-005	TM-24	Mixer Plate Decoupling
C33	.004	600	61-0179	P688-004	PTE6D4	811-005	TM-24	AGC Filter
C34	.004	600	61-0179	P688-004	PTE6D4	811-005	TM-24	Filament Bypass
C35	.004	600	61-0179	P688-004	PTE6D4	811-005	TM-24	1st V. IF Screen Bypass
C36	10		62-010009001	GP10M	5W5Q1	GP1K-10	MS-41	1st V. IF Screen Bypass
C37	.004	600	61-0179	P688-004	PTE6D4	811-005	TM-24	RF Bypass
C38	.004	600	61-0179	P688-004	PTE6D4	811-005	TM-24	AGC Filter
C39	.004	600	61-0179	P688-004	PTE6D4	811-005	TM-24	2nd V. IF Screen Bypass
C40	10		62-010009001	GP10M	5W5T1	GP1K-10	MS-41	2nd V. IF Screen Bypass
C41	.004	600	61-0179	P688-004	PTE6D4	811-005	TM-24	2nd V. IF Decoupling
C42	.004	600	61-0179	P688-004	PTE6D4	811-005	TM-24	3rd V. IF Cathode Bypass
C43	.004	600	61-0179	P688-004	PTE6D4	811-005	TM-24	3rd V. IF Screen Bypass
C44	10		62-010009001	GP10M	5W5Q1	GP1K-10	MS-41	3rd V. IF Screen Bypass
C45	.004	600	61-0179	P688-004	PTE6D4	811-005	TM-24	3rd V. IF Decoupling
C46	22		62-022009001	GP22M	5W5Q25	GP1K-22	MS-425	AGC Filter
C47	.05	200	61-0122	P288-05	PTE4S5		TM-15	AGC Filter
C48	10		62-010009001	GP10K	5W5Q1	GP1K-10	MS-41	V. Diode Filter
C49	47			CN47JNP0	5R5Q5	NP0M-50	MS-45	Fixed Trimmer *
C50	470		62-147001001	GP470M	5W5T5	GP2K-470	1FM 35	V. DET.-AGC Fil. Bypass

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C51	.1	200	61-0113	P288-1	PTE4P1		TM-1	Video Coupling
C52	.003	600	61-0109	P688-003	PTE6D3	GP2M-003	TM-23	1st V. IF Cathode Bypass
C53	51		62-056409001	CN5IJNPO	5R5Q5	NPOM-50	MS-45	Fixed Trimmer
C54	.05	400	61-0122	P488-05	PTE4S5		TM-15	Video coupling
C55	.05	400	61-0122	P488-05	PTE4S5		TM-15	Video Coupling
C56	.004	600	61-0179	P688-004	PTE6D4	811-005	TM-24	Video Coupling
C57	.5	400	45-3500-4	484-5	GT4P5		TC-5	Pic. Tube Cath. Decoupling
C58	.01	400	61-0120	P488-01	PTE4S1	821-01	TM-11	Hor. Sweep Coupling
C59	.01	400	61-0120	P488-01	PTE4S1	821-01	TM-11	AGC Coupling
C60	.5	201	61-0133	P288-5	GT2P5		TC-5	AGC Filter
C61	.004	600	61-0179	P688-004	PTE6D4	811-005	TM-24	Decoupling
C62	.001	600	45-3500-5	P688-001	PTE6D1	GP2L-001	TM-21	1st S. IF Screen Bypass
C63	.001	600	45-3500-5	P688-001	PTE6D1	GP2L-001	TM-21	1st S. IF Decoupling
C64	.001	600	45-3500-5	P688-001	PTE6D1	GP2L-001	TM-21	2nd S. IF Cath. Bypass
C65	.001	600	45-3500-5	P688-001	PTE6D1	GP2L-001	TM-21	2nd S. IF Screen Bypass
C66	.001	600	45-3500-5	P688-001	PTE6D1	GP2L-001	TM-21	2nd S. IF Decoupling
C67	.1	200	61-0113	P288-1	PTE4P1		TM-1	AFC Filter
C68	.1	200	61-0113	P288-1	PTE4P1		TM-1	AFC Filter
C69	.004	600	61-0179	P688-004	PTE6D4	GP2M-0033	TM-24	Diode Load Cap. ††
C70	.004	600	61-0179	P688-004	PTE6D4	GP2M-0033	TM-24	Diode Load Cap. ††
C71	.05	200	61-0122	P288-05	PTE4S5		TM-15	Audio Coupling
C72	470	500	60-10515307	1468-0005	5W5T5	GP2K-470	1FM-35	Tone Comp.
C73	.01	400	61-0120	P488-01	PTE4S1	821-01	TM-11	Tone Comp.
C74	.004	600	61-0179	P688-004	PTE6D4	GP2M-0047	TM-24	Tone Comp.
C75	.05	200	61-0122	P288-05	PTE4S5		TM-15	Audio Coupling
C76	.05	400	61-0122	P488-05	PTE4S5		TM-15	Audio Coupling
C77	.006	1000	61-0105	P1088-006	PTE10D6		MB-26	Output Plate Bypass
C78	.05	400	61-0122	P488-05	PTE4S5		TM-15	Sync Coupling.
C79	.1	200	61-0113	P288-1	PTE4P1		TM-1	Sync Sep. Screen Bypass
C80	.1	200	61-0113	P288-1	PTE4P1		TM-1	Vert. Sync Coupling
C81	.006	400	45-3500-7	P488-006	PTE6D6	811-005	TM-26	Vert. Sync Coupling
C82	.001	600	45-3500-5	P688-001	PTE6D1	GP2L-001	TM-21	Integrating Net
C83	.1	200	61-0113	P288-1	PTE4P1		TM-1	Vert. Osc. Grid Cap.
C84	.1	400	61-0113	P488-1	PTE4P1		TM-1	Vert. Discharge
C85	.25	400	61-0125	P488-25	GT4P25		TC-2	Vert. Sweep Coupling
C86	100	500	60-10105407	1468-0001	5W5T1	GP1K-100	1FM-31	Hor. Sync Coupling
C87	.05	400	61-0122	P488-05	PTE4S5		TM-15	Hor. Sync Amp. Decoupling
C88	1000	500	60-20105401	1467-001	1W5D1	GP2L-001	1FM-21	Hor. Sync Coupling
C89	.1	200	61-0113	P288-1	PTE4P1		TM-1	Hor. Osc. Cath. Bypass †
C90	560	500	66-10565314		1W5T6	GP2K-560	MS-36	Hor. Osc. Feedback§
C91	2000	500	60-20205304	1464-002	1R5D2		MS-22	Fixed Trimmer §
C92	100	500	60-10105017	1468-0001	5W5T1	GP1K-100	1FM-31	Hor. Osc. Decoupling **
C93	680	500	60-10685401		1W5T7	GP2K-680	1FM-37	Hor. Discharge †
C94	.01	400	61-0120	P488-01	PTE4S1	821-01	TM-11	Hor. Sweep Coupling
C95	.1	400	61-0113	P488-1	PTE4P1			Hor. Output Screen Bypass ♦
C96	1000	500	60-20105401	1467-001	1W5D1	GP2L-001	1FM-21	Hor. Output Cath. Bypass ¶
C97	.02	400	61-0108	P488-02	PTE4S2		TM-12	Damper Filter
C98	270	500	60-10275407	1468-00025	5W5T25	GP2K-270	1FM-325	Hor. Sweep Coupling #
C99	500	10000	30-1229			410-500		H. V. Filter
C100	500	10000	30-1229			410-500		H. V. Filter
C101	500	10000	30-1229			410-500		H. V. Filter ††
C102	500	10000	30-1229			410-500		H. V. Filter ††
C103	500	10000	30-1229			410-500		H. V. Filter ††
C104	.01	600	30-1226-1	P688-01	PTE6S1		TM-11	Line Filter
C105	.01	600	30-1226-1	P688-01	PTE6S1		TM-11	Line Filter
C106	5		30-1224-5	CN5CNPO	5R5V5	NPOK-5	MS-55	Fixed Trimmer *

† Models before run 3 uses 820MMF in this application.
§ Not used in models before run 3.
♦ Not used in model 48-2500 Code 121 after run2, not used in model 48-2500 Code 122 after run 9, and not used in model 48-2500-5 Code 122 after run 2.
Models 48-2500 Code 121 before run 3, models 48-2500 Code 122 before run 10, and 48-2500-5 Code 122 before run 3 use 47 MMF in this application.
¶ Not used in models before 48-2500 Code 121 run 3, 48-2500 Code 122 run 10, and 48-2500-5 Code 122 run 3.
* Not used in model 48-2500 Code 121 before run 3.
† Not used in model 48-2500 Code 122 after run 2.
** Used only in model 48-2500 Code 122 after run 7.
†† Some models use 1000 MMF in this application.
†† When either item C69 or C70 are replaced, replace both with capacitors of equal value.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1	250KΩ	½	33-5539-17	Q11-130	M-55-S	Brightness Control
R2	1000Ω	2	33-5546-6	W-1000	43-1000	Contrast Control, Wire Wound
R3	2 Meg	½	33-5535-9	Q18-139X	T-116	Volume Control, Tapped at 1 Meg.
R4A	5 Meg.	½	33-5538-9	Q11-141	M-85-S	Tone Control
B	Switch		Not Req.	76-1	SW-A	Attach to R4A per instructions
R5	200Ω	15	33-5547-2	PR-25-200	PW-25-200	Focus control, wire wound, - See Note 1
R6	250KΩ	½	33-5539-25	Q11-130	M-55-S	Auxiliary Brightness Control
R7	100K	½	33-5539-15	Q11-128	M-49-S	Vert. Hold Control
R8	25KΩ	½	33-5539-28	Q11-120	M-40-S	Hor. Hold Control - See Note 2
R9	250KΩ	½	33-5539-13	Q11-130	M-55-S	Height Control
R10	5000Ω	2	33-5546-3	W-5000	43-5000	Vert. Linearity Control, Wire Wound
R11	250KΩ	½	33-5539-13	Q11-130	M-55-S	Hor. Linearity Control
R12	200Ω	25	33-5547-2	PR-25-200	PW-25-200	Auxiliary Focus Control, Wire Wound, - See Note 1
R13	20Ω	1	33-5546-1		43-20C. T.	Hor. Cent. Control, Wire Wound, Tapped at 10Ω -Note 3
R14	20Ω	1	33-5546-1		43-20 C. T.	Vert. Cent. Control, Wire Wound, Tapped at 10Ω
R15	5000Ω	½	33-5539-16	Q11-114	M-19-S	AGC Control

Note 1: Code 121 models and Code 122 models before run 1 use 18KΩ, 50 watt control. Part No. 33-5547-1.
Note 2: All models used 250KΩ control, part No. 33-5539-13 before run 3.
Note 3: Center tap not used.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 20% UNLESS OTHERWISE STATED.
R16	100KΩ	½	66-4108540		R. F. Grid
R17	68Ω 10%	½	66-0688340		R. F. Cathode
R18	100Ω 10%	½	66-1108340		R. F. Cathode

RESISTO

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.
R19	2100Ω 10%	½	66-2278340	BTS-2700
R20	1 Meg.	½	66-5103340	BTS-1 Meg.
R21	100KΩ	½	66-4108540	
R22	56KΩ 10%	½	66-3568340	
R23	1000Ω	½	66-2108540	BTS-1000
R24	3300Ω	½	66-2333340	BTS-3300
R25	22KΩ	½	66-3228540	BTS-22K
R26	220Ω 10%	½	66-1228340	
R27	22KΩ 10%	1	66-3224340	BTA-22K
R28	560Ω 10%	½	66-1568340	BTS-560
R29	22KΩ 10%	½	66-3228540	BTS-22K
R30A	6200Ω	5		
B	820Ω	10	33-3435-5	
C	1500Ω	10		
R31	68Ω 10%	½	66-0683340	
R32	56KΩ 10%	½	66-3563340	
R33	3300Ω	½	66-2333340	BTS-3300
R34	2200Ω	½	66-2223340	BTS-2200
R35	2200Ω	½	66-2223340	BTS-2200
R36	68Ω 10%	½	66-0683340	
R37	56KΩ 10%	½	66-3563340	
R38	3300Ω	½	66-2333340	BTS-3300
R39	180Ω 10%	½	66-1183340	
R40	56KΩ 10%	½	66-3563340	
R41	3300Ω	½	66-2333340	BTS-3300
R42	100KΩ	½	66-4103340	BTS-100K
R43	470KΩ	½	66-4473340	BTS-470K
R44	3300Ω 10%	½	66-2333340	BTS-3300
R45	1 Meg.	½	66-5103340	BTS-1 Meg.
R46	120Ω 10%	½	66-1123340	
R47	10KΩ 10%	½	66-3103340	BTS-10K
R48	47KΩ 10%	½	66-3473340	BTS-47K
R49	1800Ω 10%	½	66-2183340	BTS-1800
R50	3300Ω 10%	½	66-2333340	BTS-3300
R51	820KΩ 10%	1	66-4823340	BTA-820K
R52	68Ω 10%	½	66-0683340	
R53	33KΩ 10%	2	66-3335340	BT-2-33K
R54	3500Ω 10%	9	33-1335-75	AB-3500
R55	1000Ω 10%	2	66-2105340	BT-2-1000
R56	3.90KΩ 10%	2	66-4395340	BT-2-3.90K
R57	100KΩ 10%	½	66-4103340	BTS-100K
R58	68KΩ 10%	½	66-3683340	BTS-68K
R59	10KΩ	½	66-3103340	BTS-10K
R60	27KΩ 10%	½	66-3273340	BTS-27K
R61	470KΩ	½	66-4473340	BTS-470K
R62	1 Meg.	½	66-5103340	BTS-1 Meg.
R63	1 Meg.	½	66-5103340	BTS-1 Meg.
R64	220KΩ	½	66-4223340	BTS-220K
R65	1000Ω	½	66-2103340	BTS-1000
R66	82KΩ 10%	2	66-3824340	BT-2-82K
R67	470KΩ	½	66-4473340	BTS-470K
R68	470KΩ	½	66-4473340	BTS-470K
R69	1 Meg.	½	66-5103340	BTS-1 Meg.
R70	47KΩ	½	66-3473340	BTS-47K
R71	150Ω 10%	½	66-1153340	
R72	100KΩ	1	66-4104340	
R73	3300Ω	½	66-2333340	BTS-3300
R74	560KΩ 10%	½	66-4563340	BTS-560K
R75	220KΩ	½	66-4223340	
R76	220Ω 10%	½	66-1223340	
R77	100KΩ	1	66-4104340	
R78	3300Ω	½	66-2333340	BTS-3300
R79	560KΩ 10%	½	66-4563340	BTS-560K
R80	10KΩ	½	66-3103340	BTS-10K
R81	3300Ω 10%	½	66-2333340	BTS-3300
R82	2200Ω 10%	½	66-2223340	BTS-2200
R83	27KΩ 10%	½	66-3273340	BTS-27K
R84	27KΩ 10%	½	66-3273340	BTS-27K
R85	100KΩ	½	66-4133340	BTS-100K
R86	47KΩ	½	66-3473340	BTS-47K
R87	4.7 Meg.	½	66-5473340	BTS-4.7 Meg
R88	330KΩ 10%	½	66-4333340	BTS-330K
R89	1 Meg.	½	66-5103340	BTS-1 Meg.
R90	470Ω 10%	2	66-1475360	BT-2-470
R91	22KΩ	½	66-2233340	BTS-22K
R92	2.2 Meg.	½	66-5223340	BTS-2.2 Meg
R93	1.2 Meg. 10%	½	66-5123340	BTS-1.2 Meg
R94	1 Meg. 10%	1	66-5104340	BTA-1 Meg.
R95	10KΩ 10%	½	66-3103340	BTS-10K
R96	10KΩ	½	66-3103340	BTS-10K
R97	220KΩ	½	66-4223340	BTS-220K
R98	470KΩ	½	66-4473340	BTS-470K
R99	2200Ω 10%	½	66-2223340	BTS-2200
R100	68KΩ 10%	1	66-3684340	BTA-68K
R101	22KΩ	½	66-3223340	BTA-22K
R102	10KΩ	½	66-3103340	BTA-10K
R103	100KΩ	½	66-4103340	BTA-100K
R104	10KΩ	½	66-3103340	BTA-10K
R105	470KΩ 10%	1	66-4474340	BTA-470K
R106	22KΩ	½	66-3223340	BTS-22K
R107	68KΩ 10%	½	66-3683340	BTS-68K
R108	27KΩ 10%	½	66-3273340	BTS-27K
R109	2.2 Meg.	½	66-5223340	BTS-2.2 Meg
R110	1000Ω 10%	1	66-2104340	BTA-1000
R111	2200Ω	½	66-2223340	BTS-2200
R112	100KΩ	½	66-4103340	BTS-100K
R113	10KΩ	1	66-3104340	BTA-10K
R114	10KΩ	1	66-3104340	BTA-10K
R115	120KΩ 5%	1	66-4124340	BTA-120K-5%
R116	330Ω 5%	½	66-1333340	BW-½-330-5%
R117	1000Ω 10%	½	66-2103340	BTS-1000
R118	33KΩ 5%	½	66-3333340	BTS-33K-5%
R119	2200Ω 10%	½	66-2223340	BTS-2200
R120	22KΩ	½	66-3223340	BTS-22K
R121	1800Ω 10%	½	66-2183340	BTS-1800

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C51	1	200	61-0113	P288-1	PTP4P1		TM-1	Video Coupling
C52	003	600	61-0109	P688-003	PTP6S3	GP3M-003	TM-23	1st V. IF Cathode Bypass
C53	51		62-056409001	CN5EJNP0	5R5Q5	NPOM-50	MS-45	Fixed Trimmer
C54	05	400	61-0122	P488-05	PTE4S5		TM-15	Video coupling
C55	05	400	61-0122	P488-05	PTE4S5		TM-15	Video Coupling
C56	004	600	61-0179	P688-004	PTE5D4	811-005	TM-34	Video Coupling
C57	5	400	45-3500-4	484-5	CT4Y5		TC-5	Pic. Tube Cath. Decoupling
C58	01	400	61-0120	P488-01	PTE4S1	831-01	TM-11	Hor. Sweep Coupling
C59	01	400	61-0120	P488-01	PTE4S1	831-01	TM-11	AGC Coupling
C60	5	201	61-0133	P288-5	PTP4S5		TC-5	AGC Filter
C61	004	600	61-0179	P688-004	PTE5D4	811-005	TM-34	Decoupling
C62	005	600	45-3500-5	P688-005	PTE5D5	GP2L-001	TM-21	1st S. IF Screen Bypass
C63	001	600	45-3500-5	P688-001	PTE5D1	GP2L-001	TM-21	1st S. IF Decoupling
C64	001	600	45-3500-5	P688-001	PTE5D1	GP2L-001	TM-21	2nd S. IF Cath. Bypass
C65	05	600	45-3500-5	P688-001	PTE5D1	GP2L-001	TM-21	2nd S. IF Screen Bypass
C66	001	600	45-3500-5	P688-001	PTE5D1	GP2L-001	TM-21	2nd S. IF Decoupling
C67	1	200	61-0113	P288-1	PTP4P1		TM-1	AFC Filter
C68	1	200	61-0113	P288-1	PTP4P1		TM-1	AFC Filter
C69	004	600	61-0179	P688-004	PTE5D4	GP3M-0033	TM-34	Diode Load Cap. ††
C70	004	600	61-0179	P688-004	PTE5D4	GP3M-0033	TM-34	Diode Load Cap. ††
C71	05	200	61-0122	P288-05	PTE4S5		TM-15	Audio Coupling
C72	470	500	60-10515307	1468-0005	SW5T5	GP2K-470	1FM-35	Tone Comp.
C73	01	600	61-0135	P688-01	PTE4S1	831-01	TM-11	Tone Comp.
C74	004	600	61-0179	P688-004	PTE5D4	GP3M-0047	TM-34	Tone Comp.
C75	05	200	61-0122	P288-05	PTE4S5		TM-15	Audio Coupling
C76	05	400	61-0122	P488-05	PTE4S5		TM-15	Audio Coupling
C77	006	1000	61-0105	P1068-006	PTE5D6		MS-26	Output Plate Bypass
C78	05	400	61-0122	P488-05	PTE4S5		TM-15	Sync Coupling
C79	1	200	61-0113	P288-1	PTP4P1		TM-1	Sync Sep. Screen Bypass
C80	1	200	61-0113	P288-1	PTP4P1		TM-1	Vert. Sync Coupling
C81	005	600	45-3500-7	P688-006	PTE5D6	811-005	TM-34	Vert. Sync Coupling
C82	001	600	45-3500-5	P688-001	PTE5D1	GP2L-001	TM-21	Integrating Net
C83	1	200	61-0113	P288-1	PTP4P1		TM-1	Vert. Osc. Grid Cap.
C84	1	200	61-0113	P288-1	PTP4P1		TM-1	Vert. Discharge
C85	25	400	61-0125	P488-25	GT4P25		TC-3	Vert. Sweep Coupling
C86	100	500	60-10105407	1468-0001	SW5T1	GP1K-100	1FM-31	Hor. Sync Coupling
C87	05	400	61-0122	P488-05	PTE4S5		TM-15	Hor. Sync Amp. Decoupling
C88	1000	500	60-30105401	1467-0001	IW5D1	GP2L-001	1FM-21	Hor. Sync Coupling
C89	1	200	61-0113	P288-1	PTP4P1		TM-1	Hor. Osc. Cath. Bypass †
C90	560	500	60-10565314		1W5T6	GP2K-560	MS-36	Hor. Osc. Feedback†
C91	2000	500	60-30205304	1454-002	1R5D2		MS-23	Fixed Trimmer †
C92	100	500	60-10105401	1468-0001	SW5T1	GP1K-100	1FM-31	Hor. Osc. Decoupling **
C93	680	500	60-10685401		1W5T7	GP2K-680	1FM-37	Hor. Discharge †
C94	.01	600	61-0103	P488-01	PTE4S1	831-01	TM-11	Hor. Sweep Coupling
C95		400	61-0113	P488-1	PTE4P1			Hor. Output Screen Bypass ♦
C96	1000	500	60-30105401	1467-001	IW5D1	GP2L-001	1FM-21	Hor. Output Cath. Bypass ¶
C97	02	400	61-0108	P488-02	PTE4S2		TM-13	Damper Filter
C98	270	500	60-10275407	1468-00025	SW5T25	GP2K-270	1FM-325	Hor. Sweep Coupling #
C99	1000	10000	30-1229			410-500		H. V. Filter
C100	1000	10000	30-1229			410-500		H. V. Filter
C101	1000	10000	30-1229			410-500		H. V. Filter ††
C102	1000	10000	30-1229			410-500		H. V. Filter ††
C103	500	10000	30-1229			410-500		H. V. Filter ††
C104	.01	600	30-1226-1	P688-01	PTE5S1		TM-11	Line Filter
C105	.01	600	30-1226-1	P688-01	PTE5S1		TM-11	Line Filter
C106	5		30-1234-5	CN5CNP0	5R5V5	NPOK-5	MS-55	Fixed Trimmer *

† Models before run 3 uses 820MMF in this application.
§ Not used in models before run 3.
♦ Not used in model 48-2500 Code 121 after run2, not used in model 48-2500 Code 122 after run 9, and not used in model 48-2500-5 Code 123 after run 2.
Models 48-2500 Code 122 before run 3, models 48-2500 Code 123 before run 10, and 48-2500-5 Code 122 before run 3 use 47 MMF in this application.
¶ Not used in models before 48-2500 Code 121 run 3, 48-2500 Code 122 run 10, and 48-2500-5 Code 122 run 3.
* Not used in model 48-2500 Code 121 before run 3.
♦ Not used in model 48-2500 Code 122 after run 2.
** Used only in model 48-2500 Code 123 after run 7.
†† Some models use 1000 MMF in this application.
††† When either item C69 or C70 are replaced, replace both with capacitors of equal value.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1	250KΩ		33-5539-17	QU-130	M-55-S	Brightness Control
R2	1000Ω	2	33-5546-6	W-1000	43-1000	Contrast Control, Wire Wound
R3	2 Meg.		33-5525-9	Q18-139X	T-116	Volume Control, Tapped at 1 Meg.
R4A	2 Meg.		33-5538-9	QU-141	M-65-S	Tone Control
B	Switch		Not Req.	76-1	SW-A	Attach to R4A per instructions
R5	200Ω	25	33-5547-2	PR-25-200	PW-25-200	Focus control, wire wound, - See Note 1
R6	250KΩ		33-5538-25	QU-130	M-55-S	Auxiliary Brightness Control
R7	100K		33-5539-15	QU1-128	M-49-S	Vert. Hold Control
R8	25KΩ		33-5539-28	QU1-120	M-40-S	Hor. Hold Control - See Note 2
R9	250KΩ		33-5539-13	QU-130	M-55-S	Height Control
R10	5000Ω	2	33-5546-3	W-5000	43-5000	Vert. Linearity Control, Wire Wound
R11	250KΩ		33-5539-13	QU-130	M-55-S	Hor. Linearity Control
R12	200Ω	25	33-5547-3	PR-25-200	PW-25-200	Auxiliary Focus Control, Wire Wound, - See Note 1
R13	20Ω	4	33-5546-1		43-20C. T.	Hor. Cent. Control, Wire Wound, Tapped at 10Ω - Note 3
R14	20Ω	4	33-5546-1		43-20 C. T.	Vert. Cent. Control, Wire Wound, Tapped at 10Ω
R15	5000Ω		33-5539-16	QU1-114	M-19-S	AGC Control

Note 1: Code 121 models and Code 122 models before run 1 use 10KΩ, 50-watt control. Part No. 33-5547-1.
Note 2: All models used 250KΩ control, part No. 33-5539-13 before run 3.
Note 3. Center tap not used.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 20% UNLESS OTHERWISE STATED.
R16	100KΩ		66-4108540		R. F. Grid
R17	68Ω 10%		66-0688340		R. F. Cathode
R18	100Ω 10%		66-1108340		R. F. Cathode

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
R19	2700Ω 10%	1	66-2728340	BTS-2700	R. F. Plate
R20	1 Meg.	1	66-5103340	BTS-1 Meg.	AGC Network
R21	100KΩ	1	66-4108540		Mixer Grid
R22	56KΩ 10%	1	66-3568340		Mixer Screen
R23	1000Ω	1	66-3108540	BTS-1000	Decoupling
R24	3300Ω	1	66-2333340	BTS-3300	Mixer Plate Decoupling
R25	22KΩ	1	66-3228540	BTS-22K	Osc. Grid
R26	2200Ω 10%	1	66-1228340		Osc. Cathode
R27	22KΩ 10%	1	66-3228340	BTA-22K	Voltage Divider
R28	560Ω 10%	1	66-1568340	BTS-560	AFC Network
R29	22KΩ 10%	1	66-3228540	BTS-22K	AFC Network
R30A	6200Ω	5			Decoupling, Wire Wound
B	820Ω	10	33-3435-5		Filter, Wire Wound
C	1500Ω	10			Decoupling, Wire Wound
R31	68Ω 10%	1	66-0683340		1st Video IF Cathode
R32	56KΩ 10%	1	66-3563340		1st Video IF Screen
R33	3300Ω	1	66-2333340	BTS-3300	1st Video IF Plate Decoupling
R34	2200Ω	1	66-2223340	BTS-2200	AGC Network
R35	2200Ω	1	66-2223340	BTS-2200	AGC Network
R36	68Ω 10%	2	66-0683340		2nd Video IF Cathode
R37	56KΩ 10%	1	66-3563340		2nd Video IF Screen
R38	3300Ω	1	66-2333340	BTS-3300	2nd Video IF Plate Decoupling
R39	180Ω 10%	1	66-1183340		3rd Video IF Cathode
R40	56KΩ 10%	1	66-3563340		3rd Video IF Screen
R41	3300Ω	1	66-2333340	BTS-3300	3rd Video IF Plate Decoupling
R42	100KΩ	1	66-4103340	BTS-100K	AGC Filter Network
R43	470KΩ	1	66-4473340	BTS-470K	AGC Rect. Diode Load
R44	3300Ω 10%	1	66-2333340	BTS-3300	Video DET. Diode Load
R45	1 Meg.	1	66-5103340	BTS-1 Meg.	Video Amp. Grid
R46	120Ω 10%	1	66-1123340		Video Amp. Cathode
R47	10KΩ 10%	1	66-3103340	BTS-10K	Video Amp. Screen
R48	47KΩ 10%	1	66-3473340	BTS-47K	Video Amp. Screen Decoupling
R49	1800Ω 10%	1	66-2183340	BTS-1800	Video Amp. Plate
R50	3300Ω 10%	1	66-2333340	BTS-3300	Video Amp. Plate Decoupling
R51	820KΩ 10%	1	66-4823340	BTA-820K	Video Output Grid
R52	68Ω 10%	1	66-0683340		Video Output Cathode
R53	33KΩ 10%	2	66-3333340	BT-2-33K	Video Output Screen
R54	3500Ω 10%	9	33-1335-75	AB-3500	Video Output Plate, Wire Wound
R55	1000Ω 10%	2	66-2103340	BT-2-1000	Video Output Decoupling
R56	3.9MΩ 10%	2	66-4395340	BT-2-3.9M	Voltage Divider
R57	100KΩ 10%	1	66-4103340	BTS-100K	Voltage Divider
R58	33KΩ 5%	1	66-3683340	BTS-68K	Voltage Divider
R59	10KΩ	1	66-3103340	BTS-10K	Isolation
R60	27KΩ 10%	1	66-3273340	BTS-27K	Peaking Coil Shunt
R61	470KΩ	1	66-4473340	BTS-470K	Picture Tube Grid
R62	1 Meg.	1	66-5103340	BTS-1 Meg.	D. C. Rest. Diode Load
R63	1 Meg.	1	66-5103340	BTS-1 Meg.	AGC Amp. Grid
R64	220KΩ	1	66-4223340	BTS-220K	AGC Amp. Plate
R65	1000Ω	1	66-2103340	BTS-1000	AGC Amp. Cathode
R66	82KΩ 10%	1	66-3823340	BT-2-82K	Voltage Divider
R67	470KΩ	1	66-4473340	BTS 470K	AGC Network
R68	470KΩ	1	66-4473340	BTS-470K	AGC Network
R69	1 Meg.	1	66-5103340	BTS-1 Meg.	AGC Network
R70	47KΩ	1	66-3473340	BTS-47K	1st Sound IF Grid
R71	100Ω 10%	1	66-1103340		1st Sound IF Cathode
R72	100KΩ	1	66-4104340		1st Sound IF Screen
R73	3300Ω	1	66-2333340	BTS-3300	1st Sound IF Plate Decoupling
R74	560KΩ 10%	1	66-4563340	BTS-560K	AFC Network
R75	220KΩ	1	66-4223340		2nd Sound IF Grid
R76	220Ω 10%	1	66-1223340		2nd Sound IF Cathode
R77	100KΩ	1	66-4104340		2nd Sound IF Screen
R78	3300Ω	1	66-2333340	BTS-3300	2nd Sound IF Plate Decoupling
R79	560KΩ 10%	1	66-4563340	BTS-560K	AFC Network
R80	10KΩ	1	66-3103340	BTS-10K	De-emphasis - See Note 4
R81	3300Ω 10%	1	66-2333340	BTS-3300	Balancing - See Note 4
R82	2200Ω 10%	1	66-2223340	BTS-2200	Balancing - See Note 4
R83	27KΩ 10%	1	66-3273340	BTS-27K	Disc. Diode Load
R84	27KΩ 10%	1	66-3273340	BTS-27K	Disc. Diode Load
R85	100KΩ	1	66-4133540	BTS-100K	De-emphasis
R86	47KΩ	1	66-3473340	BTS-47K	Tone Compensation
R87	4.7 Meg.	1	66-5473340	BTS-4.7 Meg.	AF Grid
R88	330KΩ 10%	1	66-4333340	BTS-330K	AF Plate
R89	1 Meg.	1	66-5103340	BTS-1 Meg.	Output Grid
R90	470Ω 10%	2	66-1473340	BT-2-470	Output Cathode, Wire Wound
R91	22KΩ	1	66-2223340	BTS-22K	Sync Sep. Grid
R92	2.2 Meg.	1	66-5223340	BTS-2.2 Meg.	Sync Sep. Grid
R93	1.2 Meg. 10%	1	66-5123340	BTS-1.2 Meg.	Sync Sep. Plate
R94	1 Meg. 10%	1	66-5104340	BTA-1 Meg.	Sync Sep. Screen
R95	10KΩ 10%	1	66-3103340	BTS-10K	Voltage Divider
R96	10KΩ	1	66-3103340	BTS-10K	Voltage Divider
R97	220KΩ	1	66-4223340	BTS-220K	Vert. Sync Amp. Grid
R98	470KΩ	1	66-4473340	BTS-470K	Vert. Sync Amp. Grid
R99	2200Ω 10%	1	66-2223340	BTS-2200	Vert. Sync Amp. Cathode
R100	68KΩ 10%	1	66-3683540	BTA-68K	Vert. Sync Amp. Plate
R101	22KΩ	1	66-3223340	BTA-22K	Vert. Sync Amp. Plate Decoupling
R102	10KΩ	1	66-3103340	BTA-10K	Vert. Osc. Grid
R103	10KΩ	1	66-4103340	BTA-10K	Vert. Osc. Plate Decoupling
R104	10KΩ	1	66-3103340	BTA-10K	Vert. Osc. Grid
R105	470KΩ 10%	1	66-4474340	BTS-470K	Vert. Osc. Plate
R106	22KΩ	1	66-3223340	BTA-22K	Vert. Osc. Plate Decoupling
R107	68KΩ 10%	1	66-3683340	BTS-68K	Voltage Divider
R108	27KΩ 10%	1	66-3273340	BTS-27K	Voltage Divider
R109	2.2 Meg.	1	66-5223340	BTS-2.2 Meg.	Vert. Output Grid
R110	1000Ω 10%	1	66-2104340	BTA-1000	Vert. Output Cathod e
R111	2200Ω	1	66-2223340	BTS-2200	Vert. Peaking
R112	100KΩ	1	66-4103340	BTS-100K	Hor. Sync. Amp. Grid
R113	10KΩ	1	66-3104340	BTA-10K	Hor. Sync. Amp. Plate
R114	10KΩ	1	66-3104340	BTA-10K	Hor. Sync. Amp. Plate Decoupling
R115	120KΩ 5%	1	66-4126340	BTA-120K-5%	Hor. Osc. Plate - See Note 5
R116	330Ω 5%	1	66-1333340	BW-1-330-5%	Hor. Osc. Grid, Wire Wound - See Note 6
R117	1000Ω 10%	1	66-2103340	BTS-1000	Hor. Osc. Cathode - See Note 7
R118	33KΩ 5%	1	66-3333340	BTS-33K-5%	Voltage Divider - See Note 8
R119	2200Ω 10%	1	66-2223340	BTS-2200	Hor. Osc. Plate - See Note 7
R120	22KΩ	1	66-3223340	BTS-22K	Hor. Osc. Plate Decoupling - See Note 9
R121	1800Ω 10%	1	66-2183340	BTS-1800	Hor. Peaking - See Note 10

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
R122	100Ω	1	66-1103340		Parasitic Supp., Wire Wound
R123	82KΩ 10%	1	66-3823340	BTS-82K	Hor. Output Grid
R124	6800Ω 10%	1	66-2683340	BTS-6800	Hor. Output Grid
R125	100Ω 10%	2	66-1103540	BW-2-100	Hor. Output Cathode, Wire Wound
R126	3300Ω 10%	2	66-2333540	BT-2-3300	Hor. Output Screen - See Note 11
R127	47KΩ 10%	1	66-3473340	BTS-47K	Damper Grid - See Note 12
R128	4700Ω 10%	1	66-3473340		Parasitic Supp.
R129	4700Ω 10%	1	66-3473340		Parasitic Supp.
R130	100KΩ 10%	1	66-4103340	BTS-100K	Damper Cathode
R131	1200Ω	2	66-2123540	BT-2-1200	Voltage Divider - See Note 13
R132	2 Meg.	5	33-1338		H. V. Rect. Load, Wire Wound
R133	2 Meg.	5	33-1338		H. V. Rect. Load, Wire Wound
R134	1 Meg.	1	66-5104340	BTA-1 Meg.	Bleeder

Note 4: Not used in Code 121 models before run 3, and Code 122 models before run 8.
Note 5: Code 121 and Code 123 models used 100KΩ resistor before run 3, Code 122 models used 180KΩ resistor before run 10.
Note 6: All models used 2200Ω resistor before run 3.
Note 7: Not used before run 3.
Note 8: Used 560KΩ resistor before run 3.
Note 9: Used 220KΩ resistor before run 3.
Note 10: Used 2200Ω resistor before run 3.
Note 11: Code 121 models used 3900Ω resistor before run 3, and Code 122 models used 3900Ω resistor before run 10.
Note 12: All models used 100KΩ before run 3.
Note 13: Not used in Code 122 models after run 1.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC at 2.5A	700VCT at .270A	5VAC at 6A	6.3VAC at 9A SEC. 4 6.3VAC at 2.5A	32-8303			TP-405

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING SEC.	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	5.5Ω	2.4Ω	32-8307	A-8110 ②	A-3002 ③		Hor. Block Osc. Trans.
T3	360Ω	200Ω	32-8304			TSO-1 ③	Vert. Block. Osc. Trans.
T4	288Ω tap. at 33Ω	SEC. 1 24Ω SEC. 2 0Ω SEC. 3 0Ω SEC. 4 0Ω	32-8309-1				Hor. Output Trans.
T5	675Ω	8Ω	32-8308	A-3035	A-8115	TSO-1	Vert. Output Trans.
T5A	10Ω		32-9608 ④				Hor. Deflection Coil
B	39Ω						Vert. Deflection Coil
T7	65Ω		76-2631-1 ⑤				Focus Coil

3 Drill one new mounting hole.
4 Deflection yoke for code 121 and early production 122.
Deflection yoke for late production code 122, part # 32-9613.
5 Focus coil for code 122.
Focus coil for code 121 part # 76-2631.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T8	7KΩ	4Ω	480Ω	.5Ω	32-8246-1	A-3849	A-2902	RO-201	

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA PHILCO PART No.	JENSEN PART No.	GUAM PART No.	NOTES
SP1	PM	4Ω	36-1610-1	ST-120 ① MOD. P10-8	10A4A	① Replace Output Transformer to match 6-8Ω voice coil.
	CONE DIA.	V. C. DIA.				
SP2	9 1/2"	1"				

PHILCO MODELS 48-2500, 48-2500-5 (Codes 121 and 122)

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000 ~/)	PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.270A	85Ω	7.5 Henries	32-8308	C-2326 ②	C-3183 ②	RC-8250 ②	② Drill new mounting holes.

COILS (RF-IF)

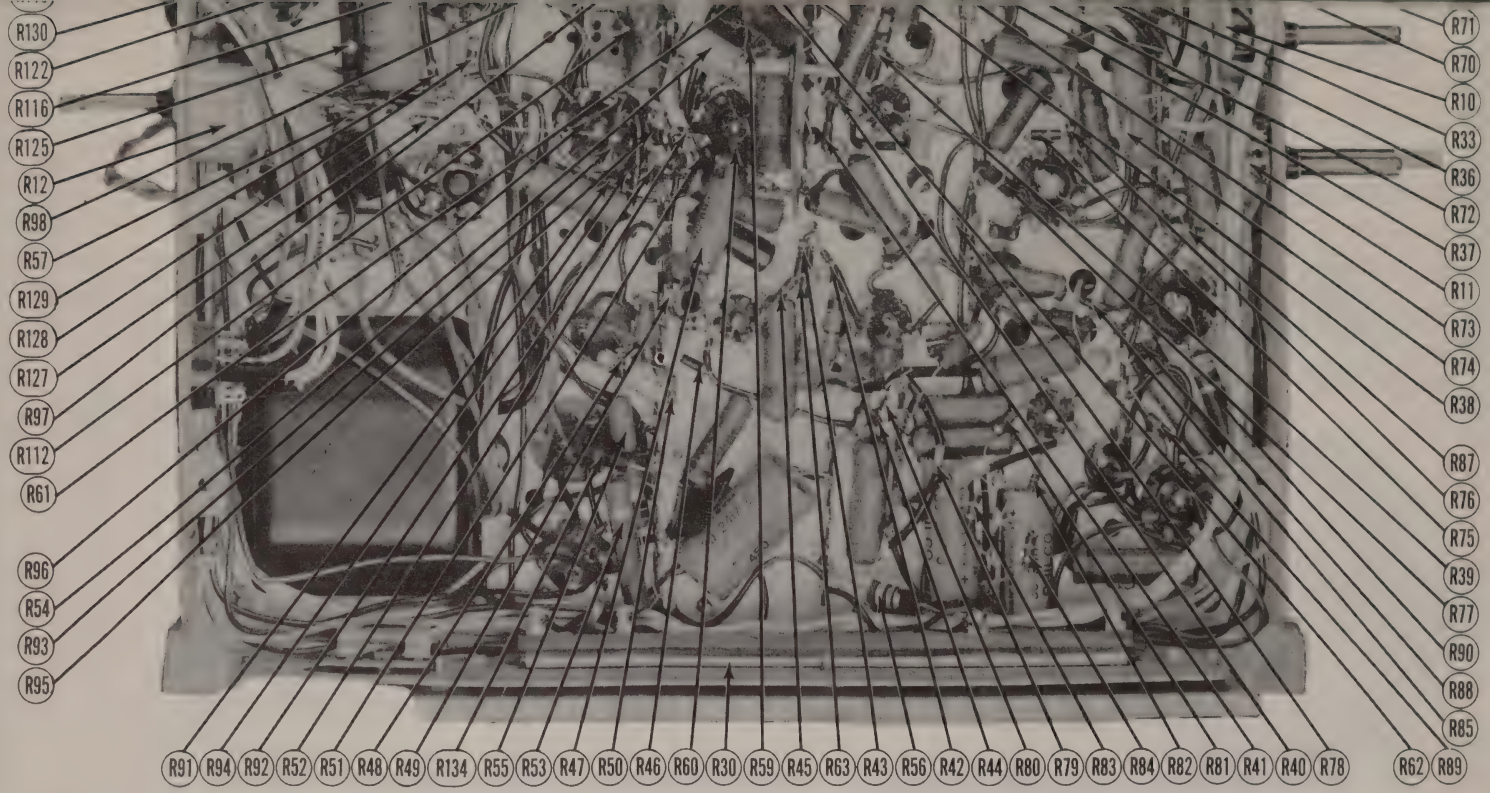
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	
L2A	Ant. Coil	0Ω		32-4115		Add Channel Number as suffix to part number for channel desired
B	RF Coupling	0Ω				
C	RF Coil	0Ω				
L3A	Mixer Grid	0Ω		32-4222		Add channel number as suffix to part number for channel desired
B	Osc. Coil	0Ω				
L4	Osc. Plate Choke	.2Ω		32-4112-2		
L5	Fil. Choke	0Ω		32-4112-4		
L6	1st Video IF	.5Ω	.3Ω	32-4093		Complete
L7	Fil. Choke	.2Ω		32-4112-3		
L8	2nd Video IF & Sound Trap	.5Ω	.3Ω	32-4213		Complete
L9	Fil. Choke	.2Ω		32-4112-3		
L10	3rd Video IF & Adj. Channel Sound Trap	.5Ω	.3Ω	32-4213-1		Complete
L11	Fil. Choke	.2Ω		32-4112-3		
L12	4th Video IF	.5Ω	.3Ω	32-4093-1		Complete
L13	Fil. Choke	.2Ω		32-4112-3		
L14	Peaking	4.6Ω		32-4143		
L15	Sound Trap	.2Ω		32-4218		Code 122 only
L16	4.5MC Trap	1Ω		32-4155		
L17	Peaking	2.2Ω		32-4143-1		
L18	Peaking	2.2Ω		32-4143-1		
L19	Peaking	2.2Ω		32-4143-1		
L20	Peaking	2.2Ω		32-4143-1		
L21	1st Sound IF	0Ω		32-4100		Complete
L22	Fil. Choke	.2Ω		32-4112-3		
L23	2nd Sound IF	0Ω		32-4099		Complete
L24A	Ratio Det. Trans	0Ω	0Ω	32-4214		Used in Code 121 only
B	Ratio Det. Trans.			32-4101		Used in Code 122 only
L25	Balancing Choke	2Ω		32-4143-1		
L26	RF Choke	2Ω		32-4143-1		Not used before Run 9 Code 122
L27	RF Choke	380Ω		32-4256		60 Millihenries. Not used before Run 3, Code 122
L28A	Width Cont.	20Ω		32-4163-1		Black Dot
B	Width Cont.			32-4163		Brown Dot
C	Width Cont.			32-4163-2		Red Dot
L29	Fil. Choke	.2Ω		32-4112-3		

DIAL LIGHTS

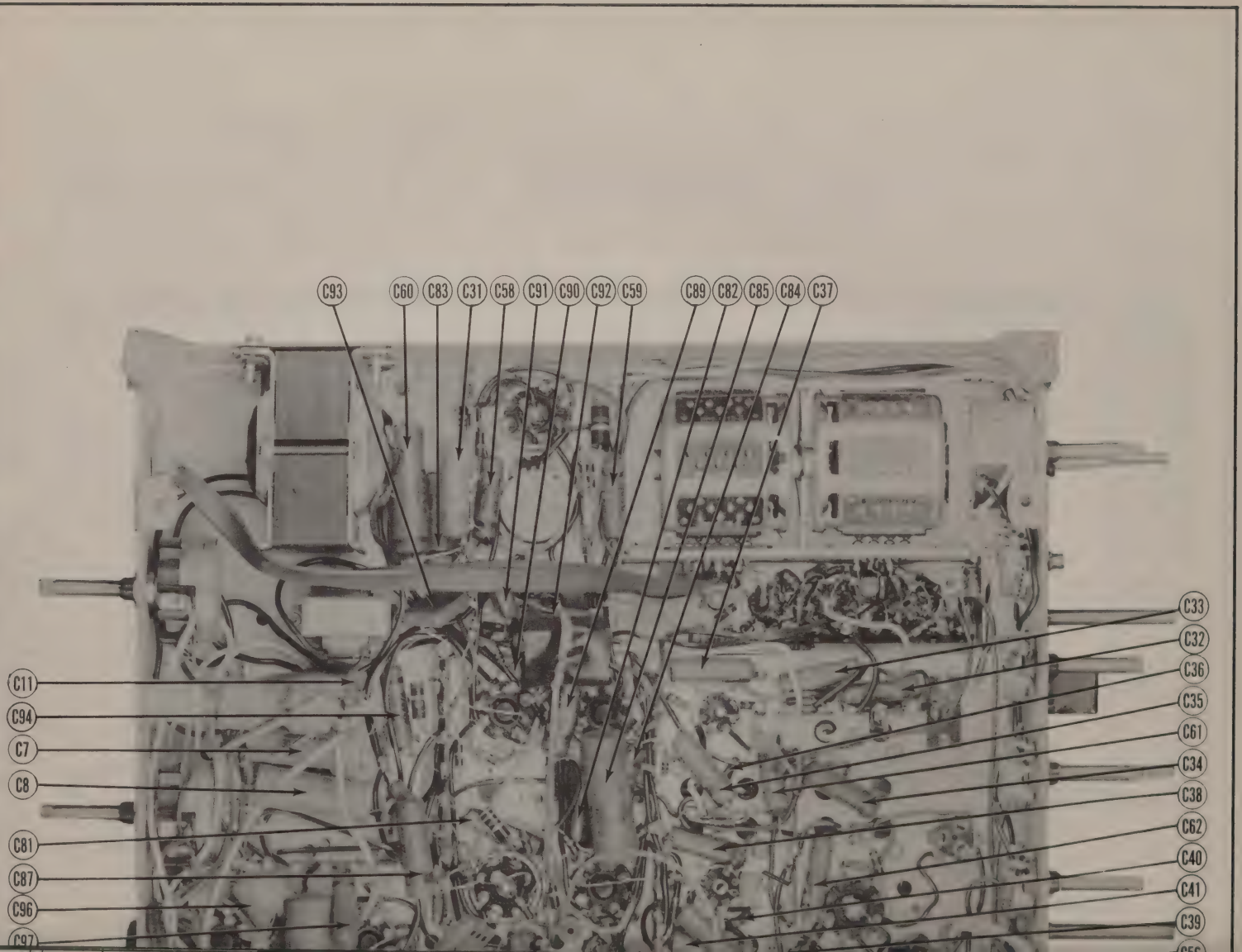
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					PHILCO PART No.		
M1	Bayonet	6-8	.2	White	34-2040		Type #51

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M2	RF Tuner	76-3109	
M3	Fuse	45-6505	Special HV Fuse. Not used in all sets
M4	Fuse	45-2656-12	.15A delayed action. Not used in all sets
M5	Fuse	45-2656-13	2.5A delayed action. Not used in all sets
M6	Fuse	45-2656-13	2.5A delayed action. Not used in all sets
M7	Fuse	42-1811	
	Cabinet	10670A	
	Cabinet Back	54-7378	
	Knob	76-2953-1	Channel selector and spring assy. Early runs
	Knob	76-3185	Channel selector and spring assy. Late runs
	Knob	56-3627-6	
	Socket	27-6229	Picture tube cable
	Corrector Lens	54-7272	
	Mirror	54-7274	12" Concave, Spherical
	Magnet	56-4059	2 required
	Optical Housing	56-4298FCP	
	Mirror	54-7263	Flat
	Glass	54-7290	Dust Cover
	Picture Screen	56-3973	



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION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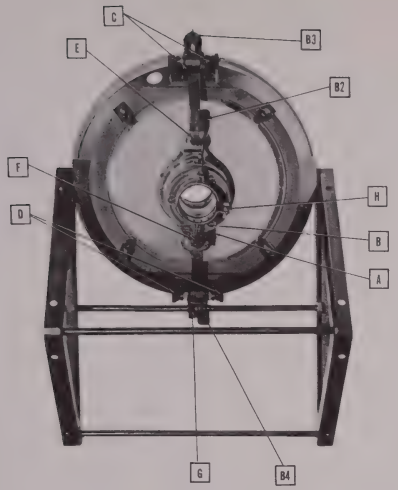

OPTICAL ADJUSTMENT POINTS

OPTICAL ADJUSTMENTS

The electrical adjustments should be properly set before attempting the optical adjustments.

1. Raise the lid containing the picture screen and check the angle between the lid and the top of the cabinet. The angle should be 67 1/2°; if necessary, loosen the locking nuts and adjust the lid adjusting screw (B1) until the angle is exactly 67 1/2°.

2. Loosen the clamping screws A and B and move the focus lever (B2) until the picture is sharpest and clearest at the bottom.

3. Tilt the lid slowly forward and observe the lines at the top of the picture; if the focus at the top of the picture improves as the lid is tilted forward, loosen lock nuts C and D and adjust B3 one turn counter-clockwise. Readjust B2 for best focus at the bottom of the picture. Repeat this step until the top and bottom of the picture go thru a focus simultaneously as B2 is moved. If the picture does not improve as the lid is tilted forward, use the same procedure outlined, except turn B3 clockwise.

4. Tilt the lid slowly forward and observe the right center, and left center of the picture. If either side improves in focus, loosen lock nuts E and F and shift the picture tube assembly to the left or right until a sharp overall focus is obtained.

5. After entire picture is in best overall focus, tighten clamping screws A and B, and locking nuts C, D, E, and F.

6. Check the optical adjustments by moving the hand about the opening above the dust cover glass to shade various portions of the picture. If no improvement in picture detail occurs as various parts of the entire picture are shaded, the optical adjustments are correct.

7. Check the lower corners of the picture for shadows. If a shadow is noticed in either corner loosen lock nut G and move the eccentric lever (B4) until no shadow exists at either lower corner. Tighten lock nut G.

PICTURE TUBE AND DEFLECTION YOKE ADJUSTMENTS

The top and bottom edges of the picture should be parallel with each other. If they are not, loosen the picture tube clamping screw (H) and rotate the picture tube until the top and bottom edges of the picture are parallel. If the top and bottom edges of the picture are parallel with each other but the entire picture is tilted with respect to the top of the screen, loosen locknuts A and B, and clamping screw F and rotate the deflection assembly and picture tube together until the top edge of the picture is parallel with the top edge of the screws.

KEYSTONE ADJUSTMENT

The sides of the picture should be parallel with each other. If they are not, the keystone magnets require adjustment. Turn the set off and remove the spherical mirror and connect a short circuit across the high voltage.

Adjust the keystone magnets as shown in figure 7. Be sure to remove the short circuit before replacing the spherical mirror or turning the set on.

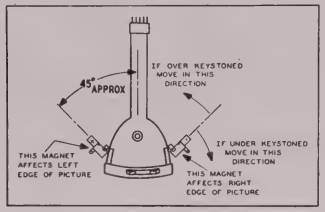
45° APPROX
IF OVER KEYSTONED MOVE IN THIS DIRECTION
IF UNDER KEYSTONED MOVE IN THIS DIRECTION
THIS MAGNET AFFECTS LEFT EDGE OF PICTURE
THIS MAGNET AFFECTS RIGHT EDGE OF PICTURE

FIG. 7

DISTORTION ADJUSTMENT

If the picture seems to be excessively bowed at the bottom, axial adjustment of the magnet pole pieces will be necessary. Turn the set off, remove the spherical mirror and connect a short across the high voltage.

Loosen the clamp band screw and move the magnets until they are in the same plane as shown in figure 8. After this adjustment it may be necessary to repeat the keystone adjustment.

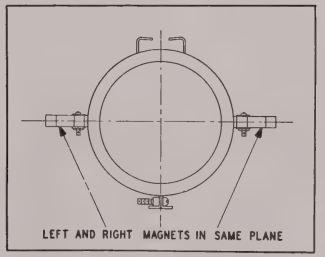

FIG. 8

PHILCO MODEL 50-621
(BATTERY-LINE OPERATED)

PHILCO MODEL 50-621
(BATTERY-LINE OPERATED)

PHILCO MODEL 50-621

TRADE NAME	Philco, Model 50-621
MANUFACTURER	Philco Corp., Tioga and "C" Sts. Philadelphia, Pa.
TYPE SET	Three Power Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 1T4 RF Amp., 1R5 Converter, 1U4 IF Amp., 1U5 DET-AVC-AF, 3V4 Power Output
POWER SUPPLY	110-120 Volts AC-DC or 9 Volts "A" Supply and 90 Volts "B" Supply in Pack Form
RATING	.15 Amp. at 117 Volts AC or 50MA at 9 Volts DC and 14MA at 90 Volts DC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer to the extreme left hand notch in lower edge of dial backplate.

Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator on front section of tuning gang. Low side to B-.	265KC (400 ~ Mod.)	Tuning gang fully closed	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	580KC	Set pointer to second notch from the left hand end of dial backplate.	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1620KC	Tuning gang fully open.	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 2 and 3 until no further improvement can be made.
4.		Loop	1500KC	Tune for max. output	"	A8, A9	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amp.	1T4	1T4	6AR	
V2	Converter	1R5	1R5	7AT	
V3	IF Amp.	1U4	1U4	6AR	
V4	DET-AVC-AF	1U5	1U5	6BW	
V5	Power Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	60	150	30-2568-26	AF1262D12A	UP7DJ1148			▲ Filter
B	30	150						■ Filter
C	10	150						▲ Filter
D	60	25						Filament Bypass
C2	100		62-110009001	GP100M	5W5T1	GP1K-100	1FM-31	RF Coupling
C3	.05	200	61-0122	P288-05	PTE4S5		TM-15	AVC Filter
C4	.05	200	61-0122	P288-05	PTE4S5		TM-15	Decoupling
C5	.1	200	61-0113	P288-1	PTE4P1		TM-1	Filament Bypass
C6	.05	400	61-0122	P488-05	PTE4S5		TM-15	Filament Bypass
C7	.05	200	61-0122	P288-05	PTE4S5		TM-15	AVC Filter
C8	.05	400	61-0122	P488-05	PTE4S5		TM-15	Filament Bypass
C9	.1	200	61-0113	P288-1	PTE4P1		TM-1	Filament Bypass
C10	1.5		30-1221-3			NPOK-1.5		Neutralizing
C11	47		30-1224-2	GP47M	5W5Q5	GP1K-47	1FM-45	Osc. Grid Cap.
C12	.003	600	61-0109	P688-003	PTE6D3	GP2M-003	TM-23	IF Decoupling
C13A	1000		30-1237	GP1000M	PTE6D1	GP2L-001	TM-21	Audio Coupling
B	10000			GP10000M	PTE4S1	821-01	TM-11	AF Amp. Screen Bypass
C	200			GP200M	5W5T2	GP2K-200	1FM-32	AF Amp. Plate
D	2000			GP2000M	PTE6D2	GP2M-002	TM-22	Audio Coupling
C14	.004	600	61-0179	P688-004	PTE6D4		TM-24	Output Plate Bypass
C15	.04	400	43-3500-2	P488-04	PTE6S4		TM-14	Line Filter

CONTROLS

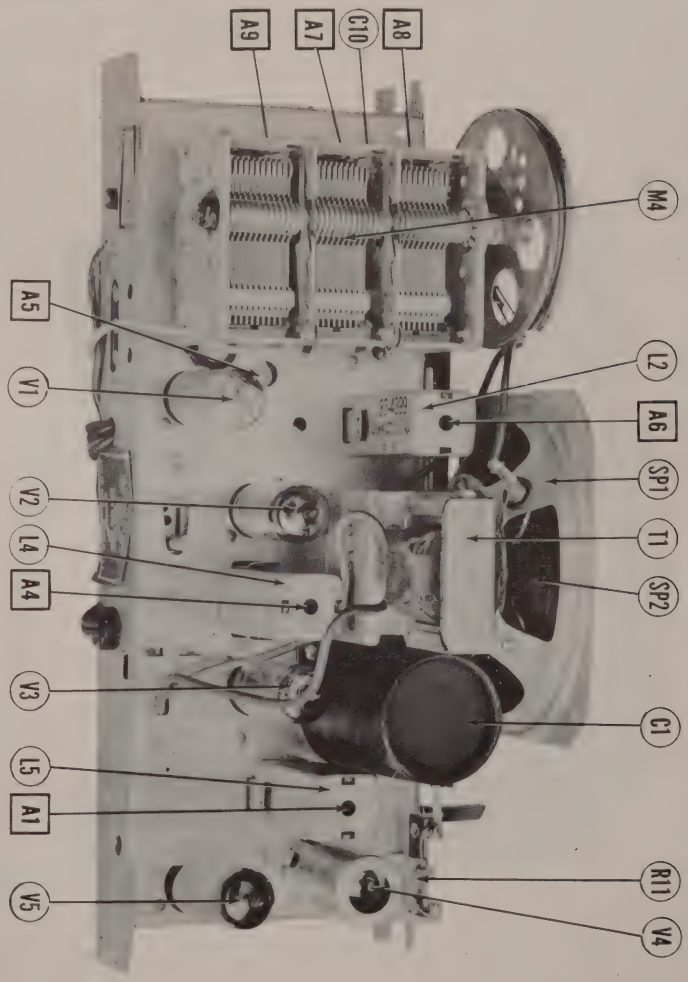
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.		33-5566-11	Q13-137	M-63-Z	Volume control
B	Switch		Not Req.	76-2	SW-A2	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
R2	1 Meg.	½	66-5108340	BTS-1 Meg.	RF Grid
R3	4.7 Meg.	½	66-5478340	BTS-4.7 Meg.	AVC Network
R4	2.2 Meg.	½	66-5228340	BTS-2.2 Meg.	AVC Network
R5	100KΩ	½	66-4108340	BTS-100K	Osc. Grid
R6	15KΩ	½	66-3158340	BTS-15K	Screen Dropping
R7	2200Ω	½	66-2228340	BTS-2200	IF Grid
R8	2200Ω	½	66-2228340	BTS-2200	IF Grid
R9	2200Ω	½	66-2228340	BTS-2200	IF Decoupling
R10	4.7 Meg.	½	66-5478340	BTS-4.7 Meg.	AVC Network
R11	4.7 Meg.	½	66-5478340	BTS-4.7 Meg.	AVC Network
R12	100KΩ	½	66-4108340	BTS-100K	Diode Filter
R13	680Ω	½	66-1688340	BTS-680	Tone Compensation
R14	120Ω	½	66-1128340	BW-½-120	Filament String, Wire Wound
R15	4.7 Meg.	½	66-5478340	BTS-4.7 Meg.	AF Grid
R16	470KΩ	½	66-4478340	BTS-470K	AF Plate
R17	2.2 Meg.	½	66-5228340	BTS-2.2 Meg.	AF Screen
R18	2.2 Meg.	½	66-5228340	BTS-2.2 Meg.	Output Grid
R19	4.7 Meg.	½	66-5478340	BTS-4.7 Meg.	Output Grid
R20	680Ω	½	66-1688340	BTS-680	Filament String
R21	150KΩ	½	66-4158340	BTS-150K	Isolation
R22	2200Ω	½	66-2228340	BTS-2200	Filter
R23A	1125Ω	5	33-3431-5	ABA-2250*	Filament Dropping, Wire Wound
B	1125Ω	5			Filament Dropping, Wire Wound
R24	60Ω	1	33-1334		Surge Limiter, Wire Wound

* Set slider at 1125Ω from one end.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	8.5KΩ	3.2Ω	700Ω	.5Ω	Part of 36-1627-9	A-3879#	A-2932 #	RO-16 #	# Bend mounting tabs down and mount on original bracket

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			PHILCO PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST-113 * †		
SP1	PM	3.2Ω	36-1627-9	MOD. P4-X	4A1 *	* Remount output transformer † Drill and tap magnet frame
	CONE DIA.	V. C. DIA.				
SP2	3 7/8"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA	
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.
L1	Loop Ant.	.5Ω	3Ω	32-4052-36	
L2	RF Coil	100Ω	5Ω	32-4399A	
L3	Osc. Coil	3Ω	11Ω	32-4263-2	14-1074
L4	Input IF	36Ω	36Ω	32-4160-2A	
L5	Output IF	36Ω	36Ω	32-4240-6A	

SELENIUM RECTIFIER

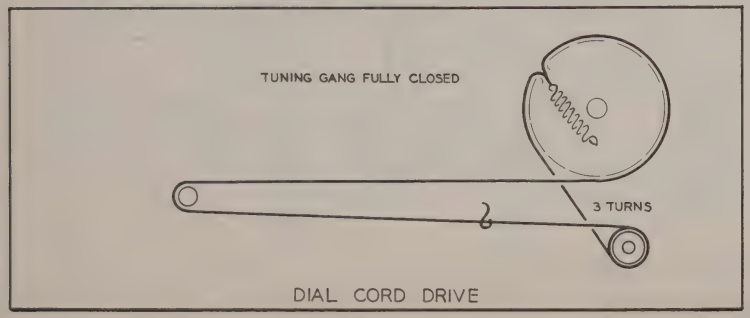
ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	PHILCO PART No.	SYLVANIA PART No.		
M1	.064A	34-8003	NB-5		

BATTERIES

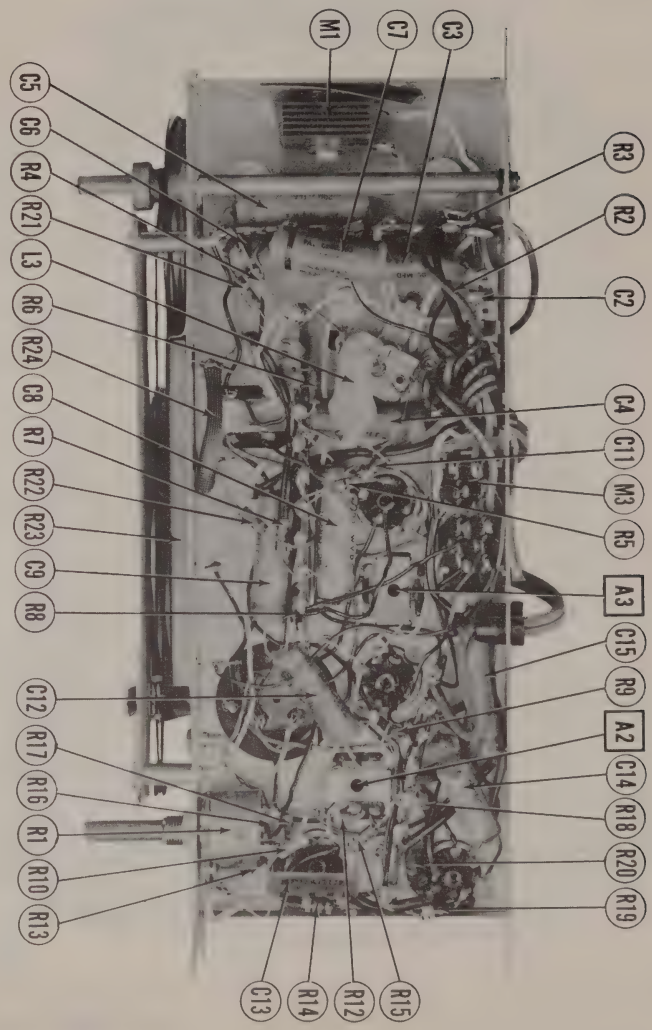
ITEM No.	VOLTAGE	PHILCO PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	9V "A" 90V "B"	P-363						T6Z60	

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M3	Switch	42-1899	AC/DC-Battery
M4	3 Gang Var. Cap.	31-2747	(24-588MMF, 22- 479MMF, 22-479MMF)
	Cabinet	10761-3	
	Dial Pointer	56-6513-2FCP	



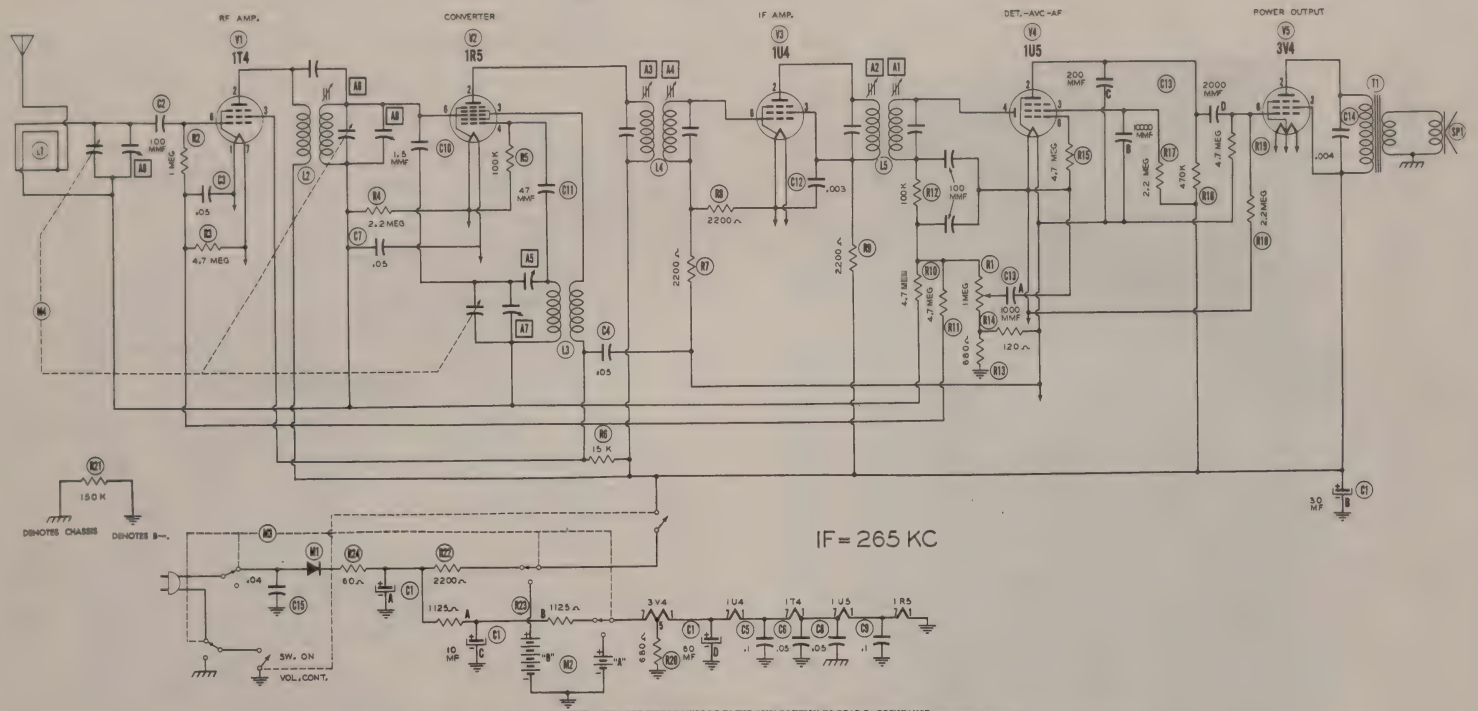
CHASSIS—BOTTOM VIEW



SET 89 FOLDER 11

PHILCO MODEL 50-621

PHILCO MODEL 50-621



NOTE : ON - OFF SWITCH MUST BE IN THE "ON" POSITION TO READ B+ RESISTANCE.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1T4	2.7VDC	80VDC	45VDC	0V.	2.7VDC	.1VDC	4VDC
V 2	1R5	0V.	80VDC	45VDC	1-7VDC	0V.	0V.	1.3VDC
V 3	1U4	4VDC	80VDC	80VDC	0V.	4VDC	3.3VDC	5.3VDC
V 4	1U5	1.3VDC	25VDC	22VDC	.3VDC	0V.	0V.	2.6VDC
V 5	3V4	5.3VDC	75VDC	80VDC	.2VDC	6.4VDC	.2VDC	7.8VDC

† TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1T4	*	†2.2KΩ	†17KΩ	Inf.	*	5 Meg.	*
V 2	1R5	*	†2.2KΩ	†17KΩ	100KΩ	*	2 Meg.	*
V 3	1U4	*	†4.4KΩ	†4.4KΩ	Inf.	*	1.1KΩ	*
V 4	1U5	*	†470KΩ	†2.2 Meg.	1 Meg.	1 Meg.	4.7 Meg.	*
V 5	3V4	*	†2.3KΩ	†2.2KΩ	1.5 Meg.	*	1.5 Meg.	*

* DO NOT MEASURE FILAMENT RESISTANCE WITH OHMMETER.
† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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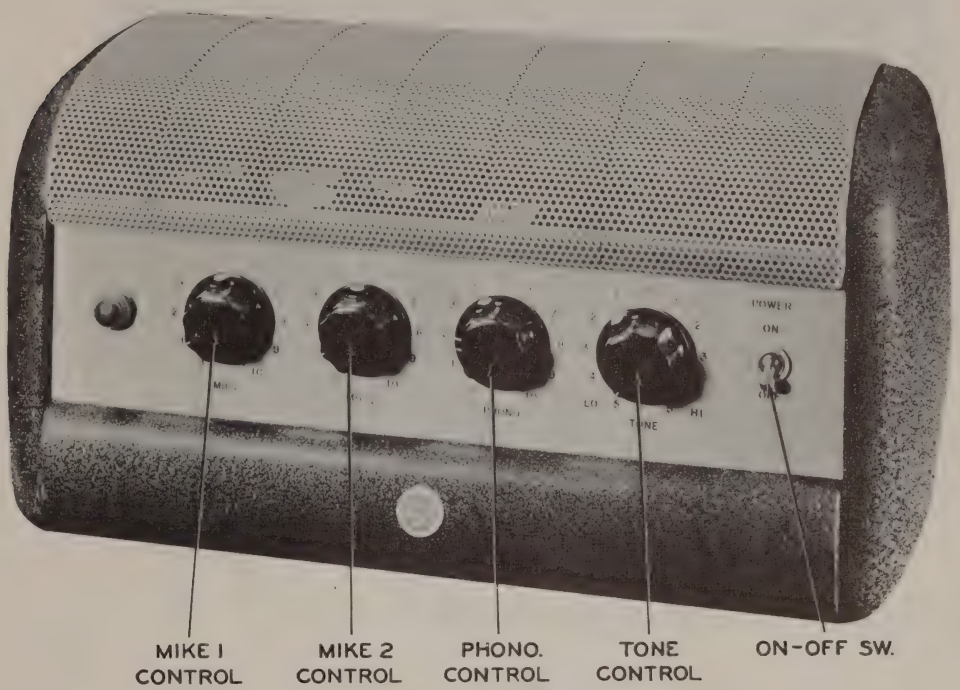
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RCA VICTOR MODELS MI-12287, MI-12288, MI-12295, MI-12299



RCA VICTOR MODELS MI-12287, MI-12288, MI-12295, MI-12299

RCA VICTOR MODEL MI-12299

TRADE NAME	RCA Victor, Models MI-12287, MI-12288, MI-12295, MI-12299
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, New Jersey
TYPE SET	AC Operated 4 Channel Audio Amplifier
TUBES(SEVEN)	Types 6J7 Mic. #1 Pre Amp., 6J7 Mic. #2 Pre Amp.-Phono #1 Amp., 6J7 1st AF Amp., 6SN7GT 2nd AF Amp.-Phase Inverter, (2) 6V6GT Power Output, 5Y3GT Rectifier
POWER SUPPLY	105-125 or 210-250 Volts AC (Models MI-12287, MI-12288) 105-125 Volts AC (Models MI-12295, MI-12299)
RATING	.78 Amp. @ 117 Volts AC

INPUTS

Models MI-12288 and MI-12299 have low-impedance microphone inputs and two high-impedance phonograph inputs. Models MI-12287 and MI-12296 have two high-impedance microphone inputs and two high-impedance phonograph inputs.

OUTPUT

Output connections are made to terminal board on rear of chassis. The terminals are marked 0, 4, 8, 15, 60 and 250 ohms. When connecting speakers make certain the impedance is equal to or slightly greater than the amplifier output impedance.

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PARTS LIST AND DESCRIPTIONS

RCA VICTOR
MODEL MI-12299

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Mic. #1 Pre Amp.	6J7	6J7	7R	
V2	Mic. #2 Pre Amp.-Phono #1 Amp.	6J7	6J7	7R	
V3	1st AF Amp.	6J7	6J7	7R	
V4	2nd AF Amp.-Phase Inverter	6SN7GT	6SN7GT	8BD	
V5	Power Output	6V6GT	6V6GT	7AC	
V6	Power Output	6V6GT	6V6GT	7AC	
V7	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RCA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	24	300	53148	PRS350/24	BR2035A		UT-203	Filter
C2A	20	450	34889	AF44J	UP2245		EL-220	■ Filter
B	20	450						▲ Filter
C3	24	300	53148	PRS350/24	BR2025A		UT-203	Filter
C4A	20	450	34889	AF44J	UP2245		EL-220	■ Decoupling
B	20	450						▲ Filter
C5	24	300	53148	PRS350/24	BR2035A		UT-203	Decoupling
C6	40	25	19807	PRS25/50	BR502A		EL-142	Mic. #1 Pre Amp. Cath. Bypass
C7	40	25	19807	PRS25/50	BR502A		EL-142	Mic. #2 Pre Amp. Cath. Bypass
C8	40	25	19807	PRS25/50	BR502A		EL-142	1st AF Amp. Cath. Bypass
C9	25	50	53147	PRS50/25	BR255A		TA-525	Output Cathode Bypass
C10	.1	400	70617	P488-1	PTE4P1		TM-1	Mic. #1 Pre Amp. Screen Bypass
C11	.1	400	70617	P488-1	PTE4P1		TM-1	Mic. #2 Pre Amp. Screen Bypass
C12	.05	400	70615	P488-05	PTE485		TM-15	Audio Coupling
C13	.05	400	70615	P488-05	PTE485		TM-15	Audio Coupling
C14	.1	400	70617	P488-1	PTE4P1		TM-1	1st AF Amp. Screen Bypass
C15	.05	400	70615	P488 05	PTE485		TM-15	Audio Coupling
C16	1200	500	53154			GP2L-0012		Tone Compensation
C17	1200	500	53154			GP2L-0012		Tone Compensation
C18	.025	400	70612	P488-025	PTE16S25			2nd AF Amp. Cath. Bypass
C19	.25	400	70618	P488-25	GT4P25		TC-2	AF Feedback
C20	.1	400	70617	P488-1	PTE4P1		TM-1	Audio Coupling
C21	.1	400	70617	P488-1	PTE4P1		TM-1	Audio Coupling

CONTROLS

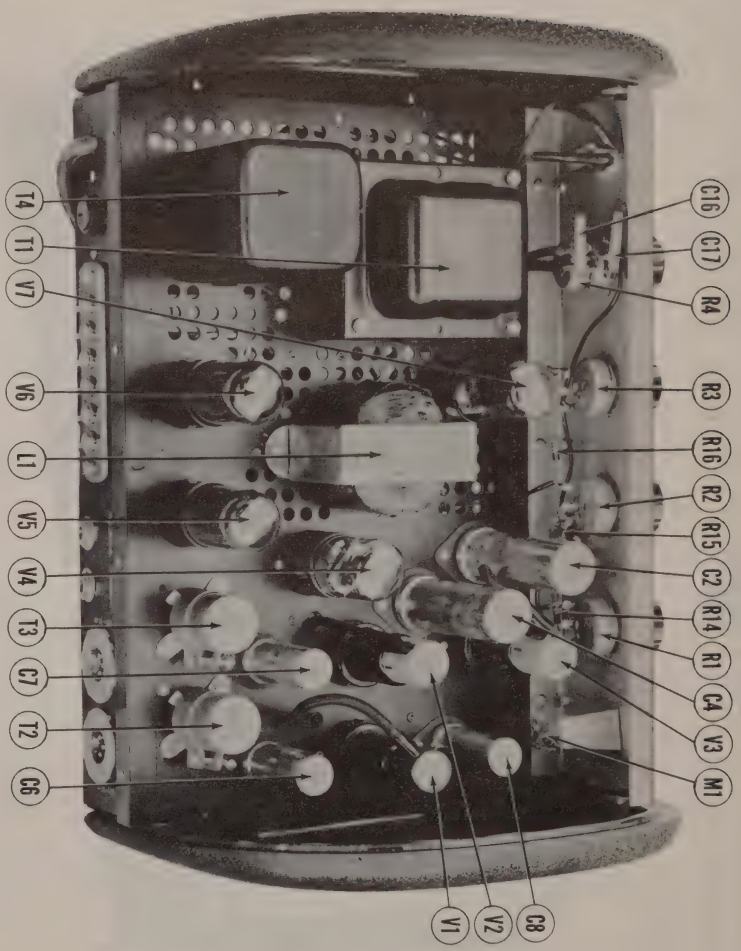
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RCA PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1	500KΩ		53144	Q13-133	M-60-Z	Mic. #1 Volume Control
R2	500KΩ		53144	Q13-133	M-60-Z	Mic. #2 Volume Control
R3	500KΩ		53144	Q13-133	M 60-Z	Phono Volume Control
R4A	1 Meg.		53145	Q11-137	8850961-1	Tone Control, Panel
B	1 Meg.			M11-137 *		Tone Control, Rear

* Attach to R4A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RCA PART No.	IRC PART No.	IDENTIFICATION CODES
R5	100KΩ			BTS-100K	Input Transformer Shunt
R6	1800Ω			BTS-1800	Mic. #1 Pre Amp. Cathode
R7	1.2 Meg.			BTS-1.2 Meg.	Mic. #1 Pre Amp. Screen
R8	270KΩ			BTS-270K	Mic. #1 Pre Amp Plate
R9	470KΩ			BTS-470K	Tone Compensation
R10	100KΩ			BTS-100K	Input Transformer Shunt
R11	1800Ω			BTS-1800	Mic. #2 Pre Amp. Cathode
R12	1.2 Meg.			BTS-1.2 Meg.	Mic #2 Pre Amp. Screen
R13	270KΩ			BTS-270K	Mic #2 Pre Amp. Plate
R14	470KΩ			BTS-470K	Isolation
R15	470KΩ			BTS-470K	Isolation
R16	470KΩ			BTS-470K	Isolation
R17	1500Ω			BTS-1500	1st AF Cathode
R18	1.2 Meg.			BTS-1.2 Meg.	1st AF Screen
R19	220KΩ			BTS-220K	1st AF Plate
R20	10KΩ			BTS-10K	Decoupling

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

R21	10KΩ	½		BTS-10K	Decoupling
R22	150KΩ	½		BTS-150K	2nd AF Grid
R23	270KΩ	½		BTS-270K	2nd AF Grid
R24	1500Ω	½		BTS-1500	2nd AF Cathode
R25	390Ω	½		BW-½-390	2nd AF Cathode
R26	56KΩ	1		BTA-56K	2nd AF Plate
R27	10KΩ	½		BTS-10K	Phase Inv. Grid
R28	1500Ω	½		BTS-1500	Phase Inv. Cathode
R29	56KΩ	1		BTA-56K	Phase Inv. Plate
R30	68KΩ	½		BTS-68K	Feedback
R31	82KΩ	½		BTS-82K	Output Grid
R32	100KΩ	½		BTS-100K	Output Grid
R33	33KΩ	½		BTS-33K	Output Grid
R34	230Ω 5%	7.4	53146		Output Cathode-Wire Wound
R35	4300Ω	1			Filter See Note
R36	4300Ω	1			Filter See Note
R37	56KΩ	2		BT-2-56K	Bleeder
R38	56KΩ	2		BT-2-56K	Bleeder
R39	150KΩ	½		BTS-150K	Bleeder
R40	150KΩ	½		BTS-150K	Bleeder
R41	150KΩ	½		BTS-150K	Bleeder
R42	150KΩ	½		BTS-150K	Bleeder

Note. Some models use two resistors in series to obtain required resistance and wattage.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1A	117VAC @ .78A	810VCT & 700V CT @ .098ADC	5VAC @ 2A	6.3VAC @ 2.7A	53830 *			
B	117VAC PRI. 1 and 2 for 25% @ .38A	810VCT @ .140A DC and 700VCT @ .107A DC	5VAC @ 2A	6.3VAC @ 2.7A	53832 #			

* Models MI-12295, MI-12299
\# Models MI-12287, MI-12288

TRANSFORMER (INPUT)

ITEM No.	RATING			REPLACEMENT DATA				INSTALLATION NOTES
	TURNS RATIO PRI. TO SEC.	DC RES. PRI.	DC RES. SEC.	RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
T2	14.06 TO 1	4Ω CT	210Ω	52775				
T3	14.06 TO 1	4Ω CT	210Ω	52775				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE PRI.	IMPEDANCE SEC.	DC RES. PRI.	DC RES. SEC.	RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
T4	7.1KΩ CT	250Ω 60Ω 18Ω 15Ω 4Ω	255Ω CT	6.7Ω 2.7Ω .8Ω .5Ω .3Ω	53149	A-3304 ‡	A-3128 ‡		‡ Drill new mounting holes.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.098A	160Ω	5.7 Henries	53831	C-1710 †	C-2993	R-885	† Drill one new mounting hole.

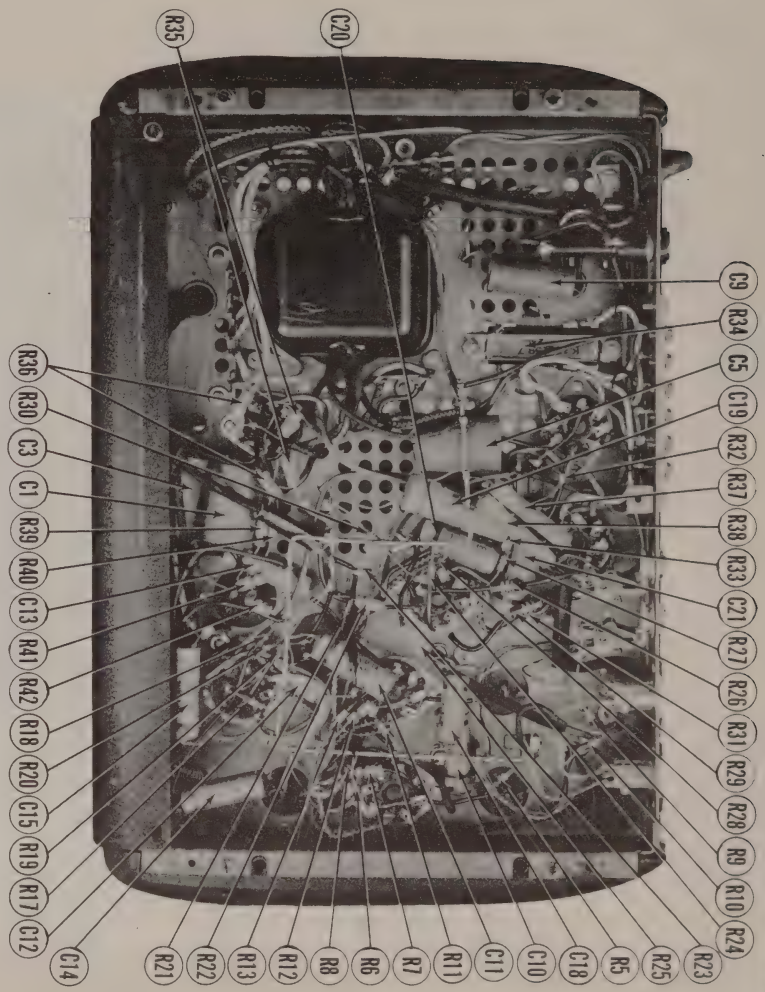
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA RCA PART No.		NOTES
M1	Bayonet	6-8	.25	Blue	11891		Type #44

SET 89

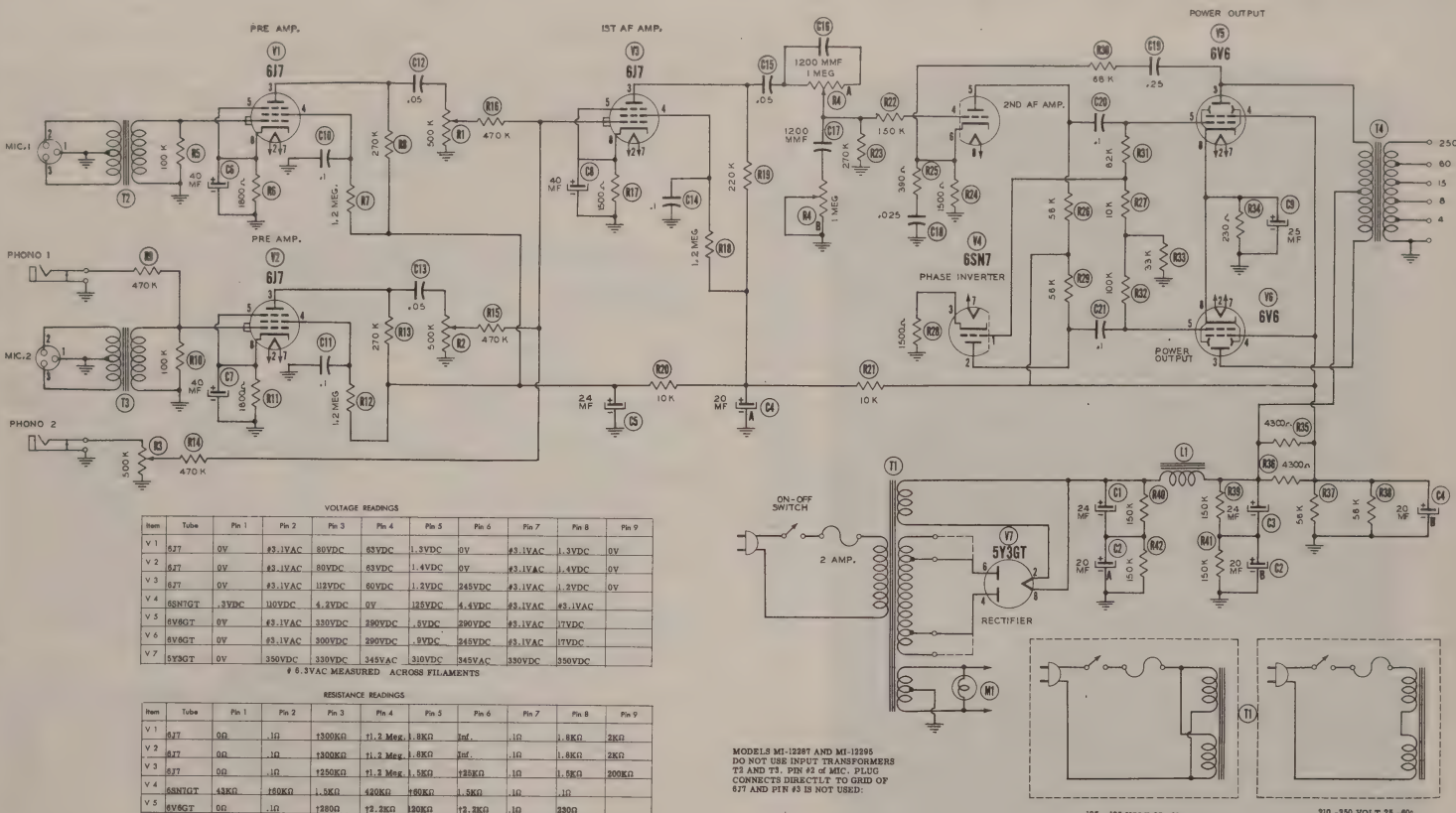
FOLDER 12

CHASSIS—BOTTOM VIEW



RCA VICTOR MODEL MI-12299

RCA VICTOR MODEL MI-12299


PRE AMP.
1ST AF AMP.
POWER OUTPUT
2ND AF AMP.
PHASE INVERTER
RECTIFIER
ON-OFF SWITCH
2 AMP.
MIC.1
MIC.2
PHONO 1
PHONO 2
6J7
6SN7
6V6
5Y3GT
1200 MMF 1 MEG
MODELS MI-12287 AND MI-12295 DO NOT USE INPUT TRANSFORMERS T2 AND T3. PIN #2 of MIC. PLUG CONNECTS DIRECTLY TO GRID OF 6J7 AND PIN #3 IS NOT USED.
105 - 125 VOLT 25 -60~ MODELS MI-12287 AND MI-12288.
210 - 250 VOLT 25 -60~ MODELS MI-12287 AND MI-12288

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J7	0V	#3.1VAC	80VDC	63VDC	1.3VDC	0V	#3.1VAC	1.3VDC	0V
V 2	6J7	0V	#3.1VAC	80VDC	63VDC	1.4VDC	0V	#3.1VAC	1.4VDC	0V
V 3	6J7	0V	#3.1VAC	112VDC	60VDC	1.2VDC	245VDC	#3.1VAC	1.2VDC	0V
V 4	6SN7GT	.3VDC	110VDC	4.2VDC	0V	125VDC	4.4VDC	#3.1VAC	#3.1VAC	
V 5	6V6GT	0V	#3.1VAC	330VDC	290VDC	.8VDC	290VDC	#3.1VAC	17VDC	
V 6	6V6GT	0V	#3.1VAC	300VDC	290VDC	.9VDC	245VDC	#3.1VAC	17VDC	
V 7	5Y3GT	0V	350VDC	330VDC	345VAC	310VDC	345VAC	330VDC	350VDC	

6.3VAC MEASURED ACROSS FILAMENTS

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J7	0Ω	.1Ω	†300KΩ	†1.2 Meg.	1.8KΩ	Inf.	.1Ω	1.8KΩ	2KΩ
V 2	6J7	0Ω	.1Ω	†300KΩ	†1.2 Meg.	1.8KΩ	Inf.	.1Ω	1.8KΩ	2KΩ
V 3	6J7	0Ω	.1Ω	†250KΩ	†1.2 Meg.	1.5KΩ	†35KΩ	.1Ω	1.5KΩ	200KΩ
V 4	6SN7GT	42KΩ	†60KΩ	1.5KΩ	420KΩ	†60KΩ	1.5KΩ	.1Ω	.1Ω	
V 5	6V6GT	0Ω	.1Ω	†280Ω	†2.2KΩ	130KΩ	†2.2KΩ	.1Ω	230Ω	
V 6	6V6GT	0Ω	.1Ω	†270Ω	†2.2KΩ	130KΩ	26KΩ	.1Ω	230Ω	
V 7	5Y3GT	Inf.	25KΩ	25KΩ	80Ω	25KΩ	75Ω	25KΩ	25KΩ	

† MEASURED FROM PIN 2 OF V7

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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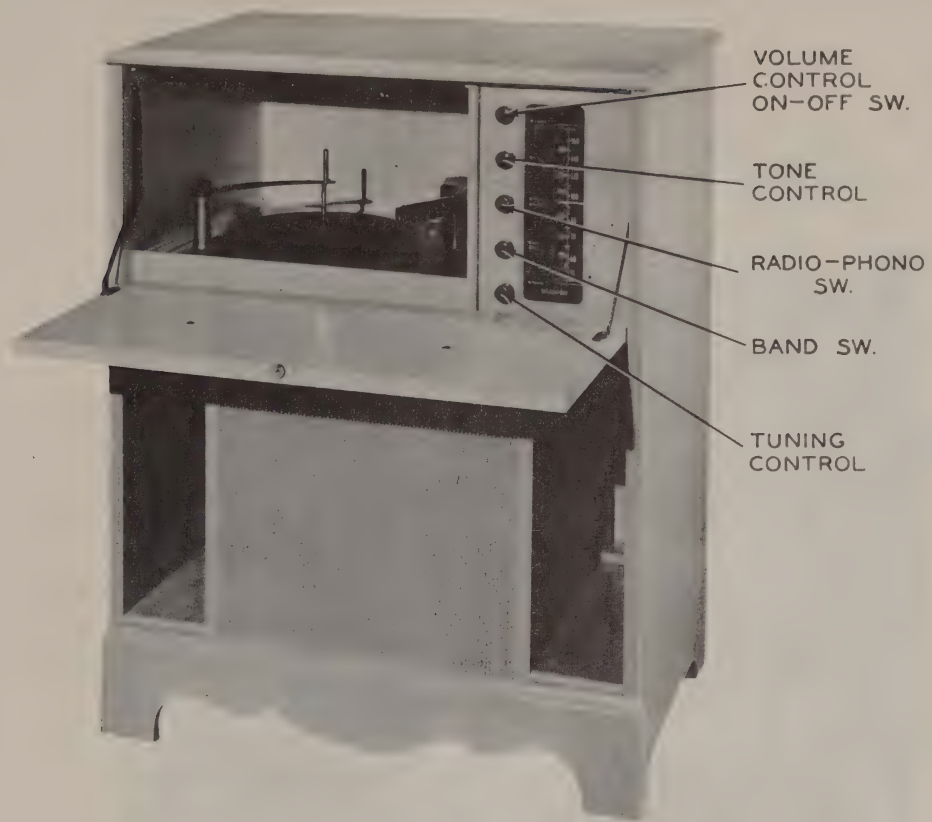
89-12

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.



RECORDIO
MODEL 9H40B

RECORDIO
MODEL 9H40B

RECORDIO MODEL 9H40B

TRADE NAME	Recordio, Model 9H40B	
MANUFACTURER	Wilcox-Gay Corp., Charlotte, Michigan	
TYPE SET	AC Operated Combination Phono-Radio, AM-FM Superheterodyne Receiver	
TUBES(SEVEN)	Types 12AT7 Converter, 6BA6 1st IF Amp., 6AU6 FM 2nd IF Amp., 6AL5 Ratio Detector, 6AT6 DET-AVC-AF, 6AQ5 Power Output, 5Y3GT Rectifier	
POWER SUPPLY	110-120 Volts AC	RATING .50 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	540-1620KC	FREQ. MOD. 88-109MC

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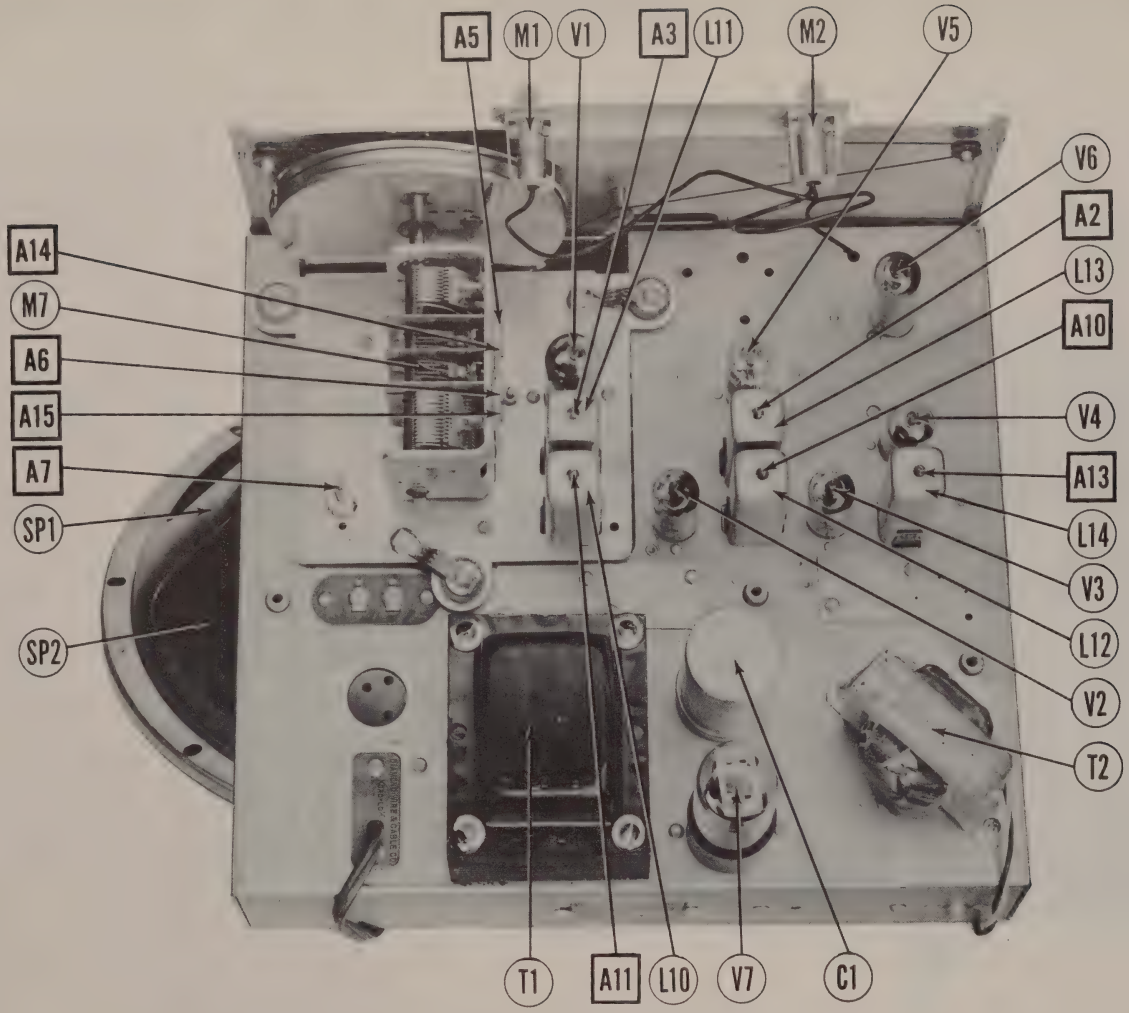
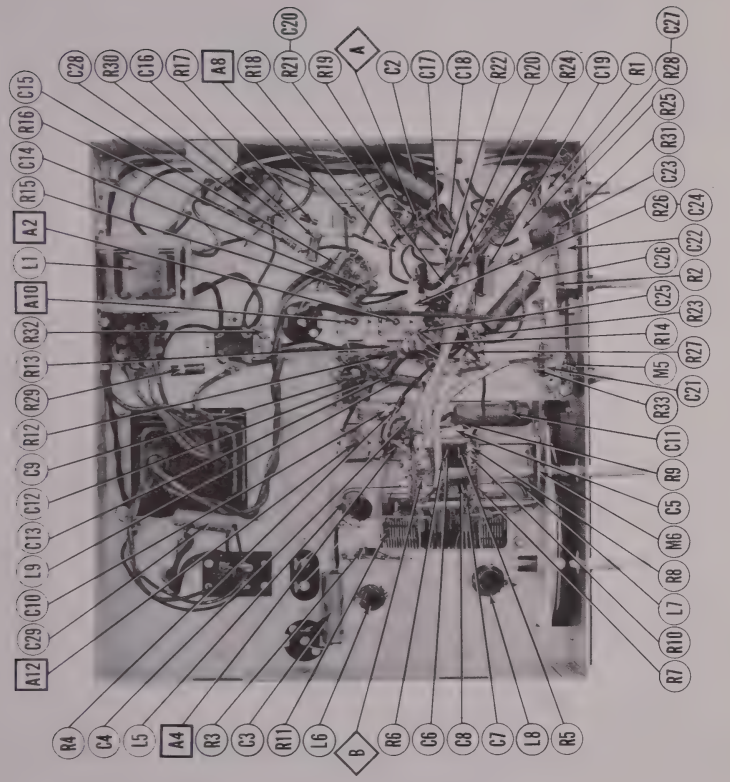
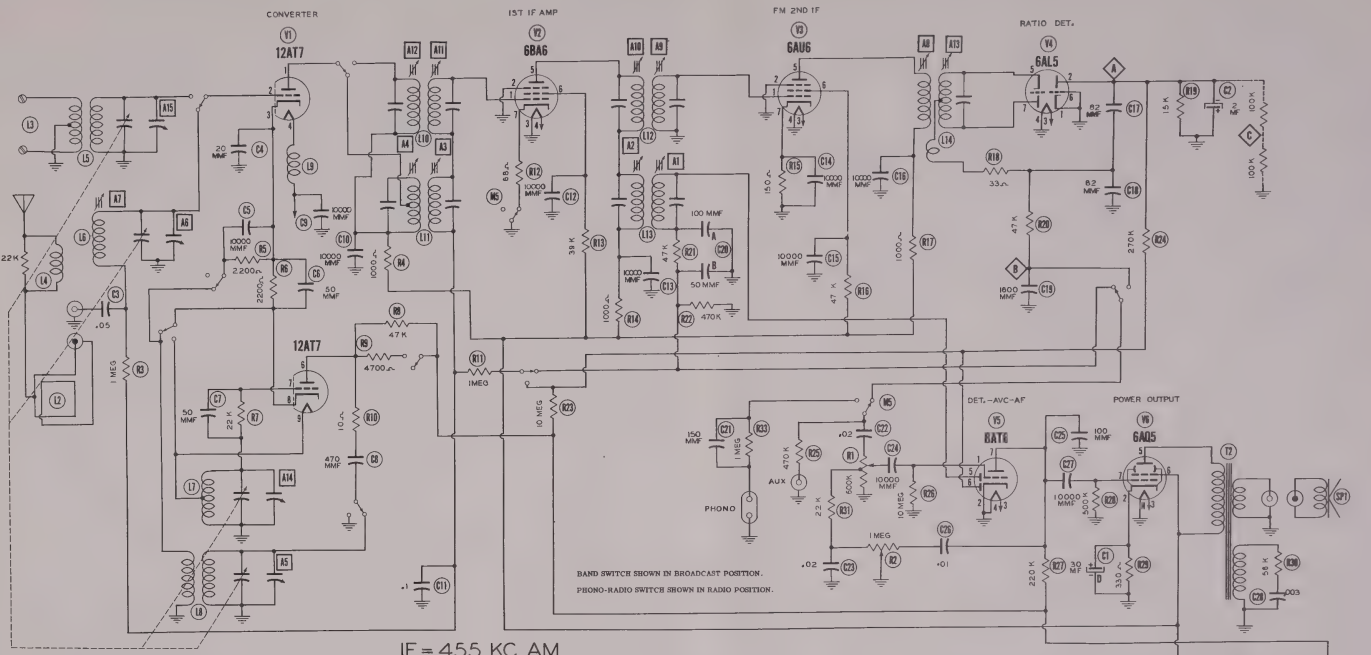

A5
M1
V1
A3
L11
M2
V5
V6
A2
L13
A10
V4
A13
L14
V3
L12
V2
T2
A14
M7
A6
A15
A7
SP1
SP2
T1
A11
L10
V7
C1





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1A	12AT7	270VDC	-.2VDC	5.6VDC	6.3VAC	6.3VAC	95VDC	8-3.8VDC	0V.	0V.
† V1B	12AT7	270VDC	0V.	4.4VDC	6.3VAC	6.3VAC	162VDC	8-2.2VDC	0V.	0V.
V2	6BA6	-.2VDC	0V.	0V.	6.3VAC	260VDC	100VDC	1VDC		
† V3	6AU6	0V.	0V.	6.3VAC	0V.	260VDC	130VDC	1.4VDC		
† V4	6AL5	0V.	-.5VDC	6.3VAC	0V.	-.3VDC	0V.	-.3VDC		
V5	6AT6	-.7VDC	0V.	6.3VAC	0V.	-.5VDC	-.1VDC	95VDC		
V6	6AQ5	0V.	12VDC	6.3VAC	0V.	250VDC	270VDC	0V.		
V7	5Y3GT	0V.	300VDC	0V.	280VAC	0V.	280VAC	0V.	300VDC	

‡ TAKEN WITH VACUUM TUBE VOLTMATER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1A	12AT7	†1.4MΩ	2.5 Meg.	1.1MΩ	.1Ω	.1Ω	†55MΩ	22MΩ	.5Ω	0Ω
† V1V	12AT7	†1.4MΩ	0Ω	2.2MΩ	.1Ω	.1Ω	†12MΩ	22MΩ	0Ω	0Ω
V2	6BA6	1.5 Meg.	0Ω	0Ω	.1Ω	†1.4MΩ	†45MΩ	6MΩ		
† V3	6AU6	1.2Ω	0Ω	.1Ω	0Ω	†1.4MΩ	†47MΩ	15MΩ		
† V4	6AL5	0Ω	15MΩ	.1Ω	0Ω	Inf.	0Ω	Inf.		
V5	6AT6	10 Meg.	0Ω	.1Ω	0Ω	500KΩ	285KΩ	†220MΩ		
V6	6AQ5	500KΩ	330Ω	.1Ω	0Ω	†1000Ω	†380Ω	500KΩ		
V7	5Y3GT	0Ω	220KΩ	Inf.	140Ω	Inf.	130Ω	Inf.	220KΩ	

† TAKEN IN FM POSITION. † MEASURED FROM PIN 8 OF V7.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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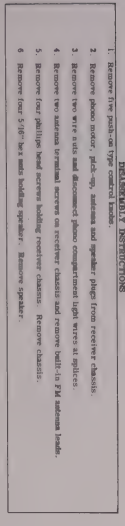

1. Remove five push-on type control knobs.
2. Remove phono motor, pick-up, antenna and speaker plugs from receiver chassis.
3. Remove two wire nuts and disconnect phono compartment light wires at splices.
4. Remove two antenna terminal screws on receiver chassis and remove built-in FM antenna leads.
5. Remove four phillips head screws holding receiver chassis. Remove chassis.
6. Remove four 5/16" hex nuts holding speaker. Remove speaker.

DISASSEMBLY INSTRUCTIONS

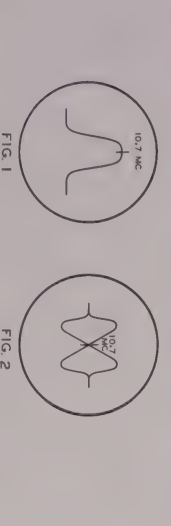


FIG. 1

FIG. 2

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Turn the function selector switch to "Radio". Turn the dial pointer to the tuning gang fully closed and set the pointer even with the end of the counterclockwise (low frequency) end of the dial scale.

AM ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an accurate indication on output meter. Keep output of signal generator connected to receiver at all times.

ITEM No.	USE	SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD DUMMY ANTENNA	SIGNAL GENERATOR Ribb. side to stator on rear section of gang. Low side to chassis.	455KC (Mod.)	AM	1500KC	Across voice coil	A5	Replace set in cabinet. Position loop antenna and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	"	1500KC	"	1500KC	"	"	"
3.	"	Loop	1400KC	"	1400KC	"	"	"
4.	"	Loop	600KC	"	600KC	"	A6	Replace set in cabinet. Position loop antenna and radiate signal into loop of receiver. Adjust for maximum output.
5.	.05MFD DUMMY ANTENNA	SIGNAL GENERATOR COUPLING Rotor side to stator of FM-Ant. section on tuning gang. Low side to chassis.	FREQUENCY MODULATION (Unmod.)	FM (CW)	88MC	VTVM Across 2.5 ohm tap on voice coil. Common to chassis.	A7	Adjust for maximum deflection. Use lowest signal input and reduce volume control setting as necessary to maintain reading of less than 5 volts.
6.	.05MFD DUMMY ANTENNA	SIGNAL GENERATOR COUPLING DC Probe Point Common to chassis.	FREQUENCY MODULATION (Unmod.)	FM (CW)	88MC	VTVM Across 2.5 ohm tap on voice coil. Common to chassis.	A8, A9, A11, A12	Adjust for zero reading. A satisfactory balance will be obtained on either side of the correct setting.
7.	.05MFD DUMMY ANTENNA Two 150Ω Carbon res.	SIGNAL GENERATOR Across FM antenna terminals with 150Ω in each lead.	FREQUENCY MODULATION (Unmod.)	FM (CW)	88MC	VTVM Across 2.5 ohm tap on voice coil. Common to chassis.	A8, A9, A11, A12	Adjust for maximum deflection. Use lowest signal input and reduce volume control setting as necessary to maintain reading of less than 5 volts.
8.	.05MFD	"	"	"	"	"	A13	Adjust for zero reading. A satisfactory balance will be obtained on either side of the correct setting.

FM IF ALIGNMENT (88MC) AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (± 5%) resistors in series from point A to chassis. The junction of these two resistors is alignment point C as shown on the schematic.

ITEM No.	USE	SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	VTVM CONNECT	ADJUST	REMARKS
1.	.05MFD DUMMY ANTENNA Two 150Ω Carbon res.	SIGNAL GENERATOR COUPLING Rotor side to stator of FM-Ant. section on tuning gang. Low side to chassis.	FREQUENCY MODULATION (Unmod.)	FM (CW)	88MC	Across 2.5 ohm tap on voice coil. Common to chassis.	A8, A9, A11, A12	Adjust for maximum deflection. Use lowest signal input and reduce volume control setting as necessary to maintain reading of less than 5 volts.
2.	"	"	"	"	90MC	"	"	"
3.	"	"	"	"	94MC	"	"	"
4.	"	"	"	"	98MC	"	"	"
5.	"	"	"	"	102MC	"	"	"
6.	"	"	"	"	106MC	"	"	"
7.	"	"	"	"	110MC	"	"	"
8.	.05MFD	"	"	"	"	"	A13	Adjust for zero reading. A satisfactory balance will be obtained on either side of the correct setting.

Use frequency modulated signal with 40 ± modulation and 400KC sweep. Use 10K ohm sweep voltage in scope for horizontal deflection.

ITEM No.	USE	SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
1.	.05MFD DUMMY ANTENNA Two 150Ω Carbon res.	SIGNAL GENERATOR COUPLING Rotor side to stator of FM-Ant. section on tuning gang. Low side to chassis.	FREQUENCY MODULATION (Sweep)	FM (CW)	88MC	Vert. Amp. to Detector Load Low side to chassis.	A13	Disconnect stabilizer capacitor and adjust for maximum amplitude and symmetry as per Fig 1.
2.	"	"	"	"	90MC	"	"	Reconnect capacitor (C2). Adjust all cores for maximum amplitude of crossover lines as per Fig 2. A SLIGHTLY retouch A5 for maximum symmetry of crossover lines.
3.	"	"	"	"	94MC	"	"	"
4.	"	"	"	"	98MC	"	"	"
5.	"	"	"	"	102MC	"	"	"
6.	"	"	"	"	106MC	"	"	"
7.	"	"	"	"	110MC	"	"	"
8.	.05MFD	"	"	"	"	"	A14, A15	Adjust for maximum deflection. If 3 peaks are noted on A14, use the one with least capacity.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: RECORDIO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12AT7	12AT7	9A	
V2	1st IF Amp.	6BA6	6BA6	7BK	
V3	FM 2nd IF Amp.	6AU6	6AU6	7BK	
V4	Ratio Det.	6AL5	6AL5	6BT	
V5	Det.-AVC-AF	6AT6	6AT6	7BT	
V6	Power Output	6AQ5	6AQ5	7BZ	
V7	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RECORDIO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	12	450	18-2049	AF222J5A	UP1145C		EL-431	▲ Filter
B	12	450						■ Filter
C	10	450						▲ Decoupling
D	30	25						Output Cathode Bypass
C2	2	150	18-2059	PRS150/4	BR415		UT-41	Stabilizing Cap.
C3	.05	400		P488-05	PTE485		TM-15	RF Coupling
C4	30			GP20M	5W5Q2	GP1K-22	MS-42	Conv. Cathode Bypass
C5	10000			BPD-10	PTE4S1	821-01	36C1	Conv. Cathode Bypass
C6	50			GP50M	5W5Q5	GP1K-50	1FM-45	Conv. Cathode Bypass
C7	50			GP50M	5W5Q5	GP1K-50	1FM-45	Osc. Grid Cap.
C8	470	500		1468-0005	5W5T5	GP2K-470	1FM-35	Osc. Feedback
C9	10000			BPD-10	PTE4S1	821-01	36C1	Filament Bypass
C10	10000			BPD-10	PTE4S1	821-01	36C1	Conv. Plate Decoupling
C11	.1	200		P288-1	PTE4P1		TM-1	AVC Filter
C12	10000			BPD-10	PTE4S1	821-01	36C1	1st IF Screen Bypass
C13	10000			BPD-10	PTE4S1	821-01	36C1	1st IF Plate Decoupling
C14	10000			BPD-10	PTE4S1	821-01	36C1	2nd IF Cathode Bypass
C15	10000			BPD-10	PTE4S1	821-01	36C1	2nd IF Screen Bypass
C16	10000			BPD-10	PTE4S1	821-01	36C1	2nd IF Plate Decoupling
C17	82	500		1468-0008	5W5T1	GP1K-100	1FM-31	Diode Load Cap. See Note 1
C18	82	500		1468-0001	5W5T1	GP1K-100	1FM-31	Diode Load Cap. See Note 1
C19	1800	500		1467-0015	1W5D15	GP2L-0015	1FM-215	De-emphasis
C20A	100			GP100M	5W5T1	GP1K-100	1FM-31	Diode RF Filter See Note 2
B	50			GP50M	5W5Q5	GP1K-50	1FM-45	Diode RF Filter See Note 2
C21	150	500		1468-0001S	5W5T1S	GP2K-150	1FM-315	Tone Compensation
C22	.02	400		P488-02	PTE4S2		TM-12	Audio Coupling
C23	.02	400		P488-02	PTE4S2		TM-12	Tone Compensation
C24	10000			GP10000M	PTE4S1	821-01	TM-11	Audio Coupling See Note 3
C25	100	500		1468-0008	5W5T1	GP1K-100	1FM-31	AF Amp. Plate Bypass
C26	.01	800		P688-01	PTE6S1	821-01	TM-11	Tone Compensation
C27	10000			GP10000M	PTE4S1	821-01	TM-11	Audio Coupling See Note 4
C28	.003	600		P888-003	PTE6D3	GP2M-003	TM-23	Tone Compensation
C29	.01	600		P688-01	PTE6S1	821-01	TM-11	Line Filter

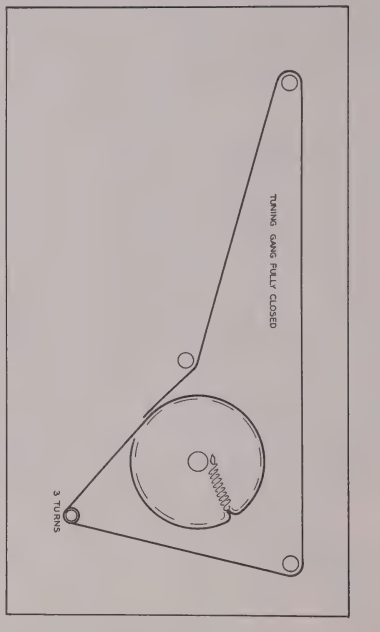
Note 1. When either item C17 or C18 are replaced, replace both with capacitors of equal value.
Note 2. Items C20A, C20B and R21 are combined into one unit.
Note 3. Items C24 and R26 are combined into one unit.
Note 4. Items C27 and R28 are combined into one unit.

SET NO

CONTROLS

FOLDER ID

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RECORDIO PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	500KΩ	½		Q13-133X	T-78	Volume control, tapped at 150KΩ.
B	Switch			76-1	SW-A	Attach to R1A per instructions.
R3	1 Meg.	½		Q13-137	M-63-Z	Tone control



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RECORDIO PART No.	IRC PART No.	IDENTIFICATION CODES
R3	1 Meg.	½		BTS-1 Meg.	AVC Network.
R4	1000Ω	½		BTS-1000	Conv. plate decoupling.
R5	2200Ω	½		BTS-2200	Conv. cathode.
R6	2200Ω	½		BTS-2200	Conv. cathode.
R7	22KΩ	½		BTS-22K	Osc. grid.
R8	47KΩ	½		BTS-47K	Osc. plate.
R9	4700Ω	1		BTA-4700	Osc. plate.
R10	10Ω	½			Parasitic Supp.
R11	1 Meg.	½		BTS-1 Meg.	AVC Network.
R12	68Ω	½			1st IF cathode.
R13	39KΩ	1		BTA-39K	1st IF screen.
R14	1000Ω	½		BTS-1000	1st IF plate decoupling.
R15	150Ω	½			2nd FM IF cathode.
R16	47KΩ	½		BTS-47K	2nd FM IF screen.
R17	1000Ω	½		BTS-1000	2nd FM IF plate decoupling.
R18	33Ω	½			Balancing.
R19	15KΩ	½		BTS-15K	Ratio Det. diode load.
R20	47KΩ	½		BTS-47K	De-emphasis
R21	47KΩ	½		BTS-47K	Diode filter - See Note 1.
R22	470KΩ	½		BTS-470K	Diode load.
R23	10 Meg.	½		BTS-10 Meg.	Delayed AVC.
R24	270KΩ	½		BTS 270K	AVC network.
R25	470KΩ	½		BTS-470K	Tone compensation.
R26	10 Meg.	½		BTS-10 Meg.	AF grid - See Note 2.
R27	220KΩ	½		BTS-220K	AF plate.
R28	500KΩ	½		BTS-470K	Output grid. See note 3
R29	330Ω	1		BTA-330	Output cathode.
R30	56KΩ	½		BTS-56K	Tone compensation.
R31	22KΩ	½		BTS-22K	Tone compensation.
R32	6800Ω	1		BTA-6800	Filter
R33	1 Meg.	½		BTS-1 Meg.	Tone compensation.

Note 1. Items C20A, C20B and R21 are combined into one unit.
Note 2. Items C24 and R26 are combined into one unit.
Note 3. Items C27 and R28 are combined into one unit.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: RECORDIO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC at .50A	800VCT at .064 ADC	5VAC at 2A	6.3VAC at 2.3A	80-2158-2	P-6180*	P-2952*	PH-70

* Add series resistor to reduce plate voltage.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: RECORDIO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T2	5.7KΩ	3 5Ω, 730Ω	40	SEC. 1 3.5KΩ SEC. 2	81-2093	A-3824	A-2902#	RO-9	# Drill one new Mtg. hole.

SPEAKER

ITEM No.	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: RECORDIO PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
SP1	PM CONE DIA.	3.2Ω V. C. DIA.		ST-1021 MOD: P12-S	12A4A	† Replace Output Trans. to match 6-8Ω voice coil.
SP2	11 3/4"	1"				

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE @ CURRENT (1000 ~)	REPLACEMENT DATA: RECORDIO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.064A	380Ω	10 Henries	14-2097	C-1723	C-2990#	R-650#	#Drill one new Mtg. hole.

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA: RECORDIO PART No.	REPLACEMENT DATA: MEISSNER PART No.	
		PRI.	SEC.			
L2	AM Ant.	0Ω				300Ω line around cabinet.
L3	FM Ant.	0Ω				300Ω line in cabinet.
L4	AM Ant. Load.	1.5Ω				
L5	FM Ant. Coil	0Ω				
L6	AM Ant. Coil	1.5Ω				
L7	FM Osc. Coil	0Ω				
L8	AM Osc. Coil	.5Ω	3Ω		14-1080	
L9	Fil. Choke	.2Ω				
L10	1st FM IF	1.2Ω	1.2Ω			
L11	1st AM IF	13Ω	13Ω			Tapped at 2Ω.
L12	2nd FM IF	1.2Ω	1.2Ω			
L13	2nd AM IF	13Ω	13Ω		16-6678	
L14	Ratio Det. Trans.	2.5Ω	5Ω			

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: RECORDIO PART No.	NOTES
M1	Bayonet	6-8	.35	Blue		Type #44.
M2	Bayonet	6-8	.25	Blue		Type #44.
M3	Bayonet	6-8	.25	Blue		Type #44.

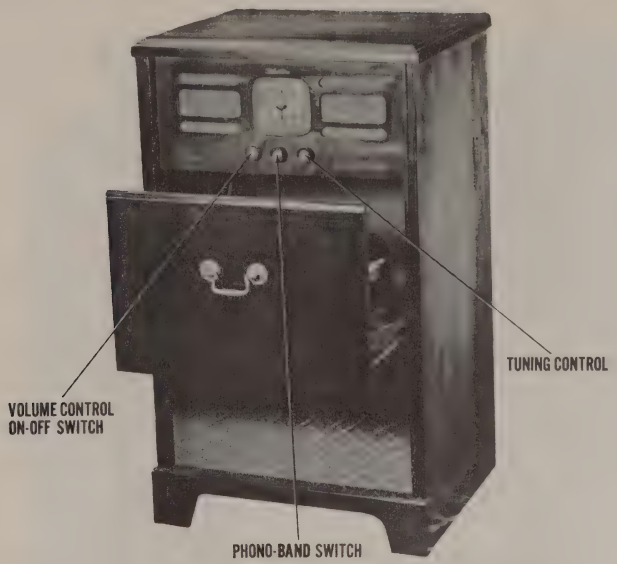
PHONO CARTRIDGE and NEEDLE

ITEM No.	RECORDIO PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	REMARKS
M4		LQD-1J	QJ or M Q33J or Q33M	W22AB	A65MG A62A	

MISCELLANEOUS

ITEM No.	PART NAME	RECORDIO PART No.	NOTES
M5	Switch		Radio - Phono.
M6	Switch		Band.
M7	2 Gang Var. Cap.		(17-509 MMF, 11-207MMF).

SILVERTONE MODEL
9105 (Ch. 132.875)



SILVERTONE MODEL 9105

TRADE NAME	Silvertone, Model 9105 (Ch. 132.875)	
SUPPLIER	Sears, Roebuck and Co., 925 S. Homan St., Chicago, Illinois	
TYPE SET	AC Operated Combination Phono-Radio, AM-FM Superheterodyne Receiver with Loop Antenna	
TUBES(EIGHT)	Types 6BA6 FM RF Amp., 12AT7 FM Converter, 6BE6 AM Converter, 6BA6 1st IF Amp., 6BA6 FM 2nd IF Amp., 6T8 DET-AVC-AF, 6AQ5 Power Output, 6X4 Rectifier	
POWER SUPPLY	105-120 Volts AC	RATING .38 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	540-1600KC	FREQ. MOD. 88-108MC

TUNING GANG FULLY CLOSED

DIAL CORD DRIVE

SILVERTONE MODEL
9105 (Ch. 132.875)

HOWARD W. SAMS & CO., INC. • Indianapolis 1, Indiana

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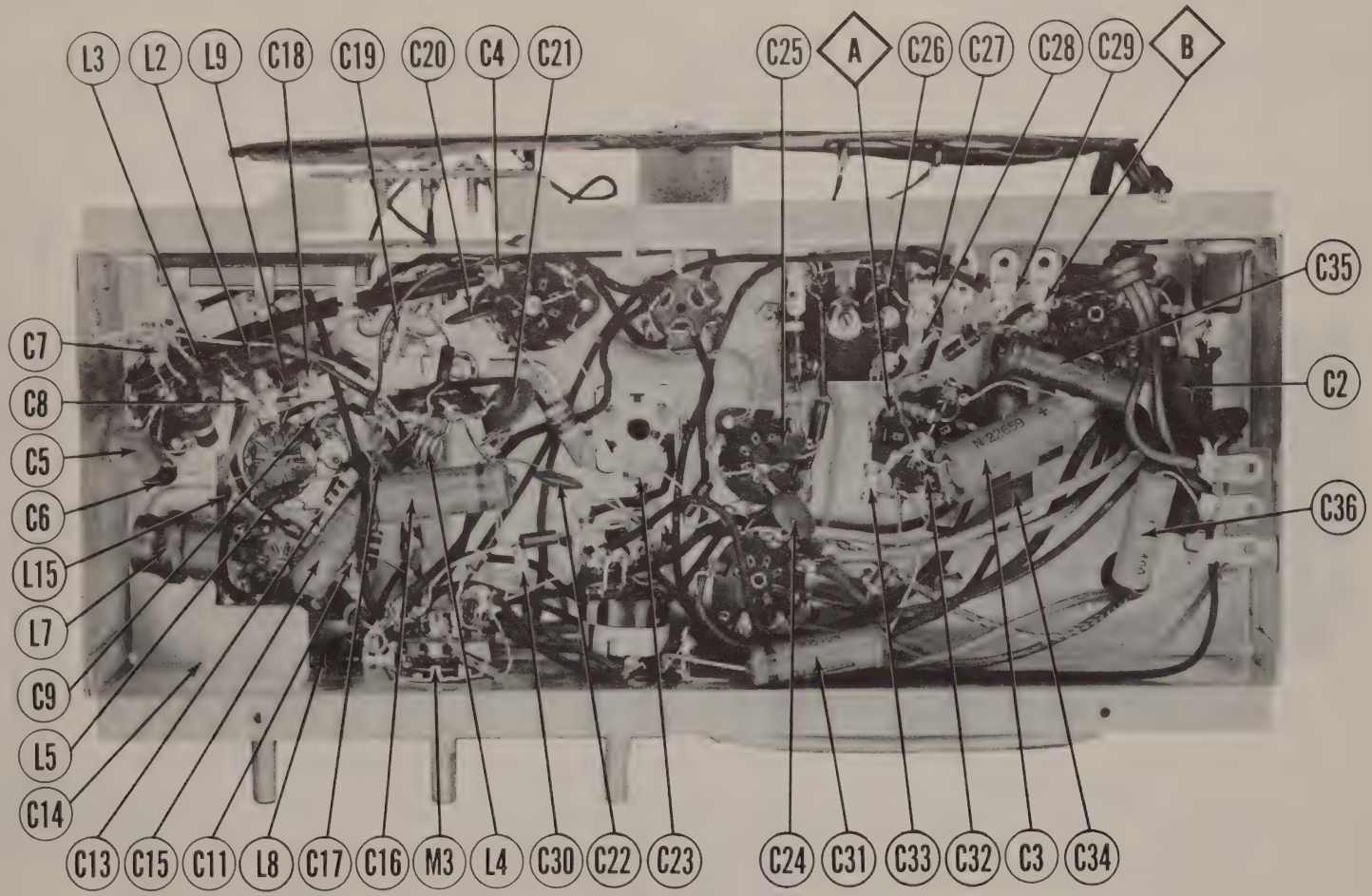
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L9
C18
C19
C20
C4
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A
C26
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C8
C5
C6
L15
L7
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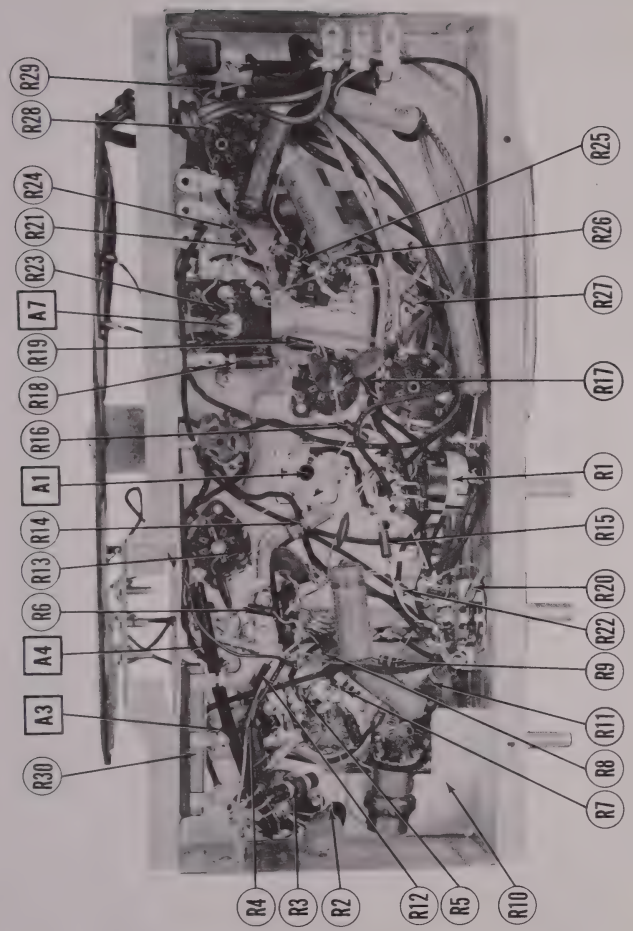

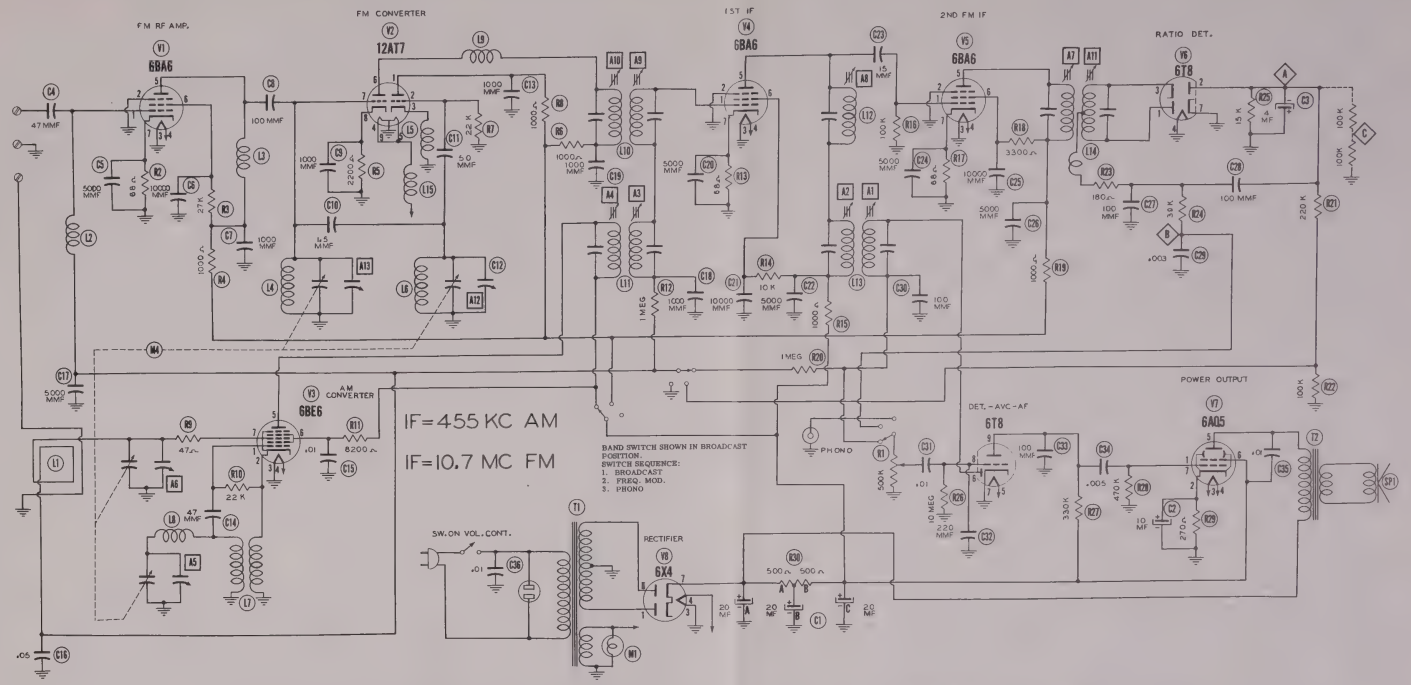

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
	V1	6BA6	-.4VDC	0V.	0V.	6.3VAC	135VDC	70VDC	.6VDC	
†	V2	12AT7	135VDC	†-1VDC	0V.	6.3VAC	6.3VAC	135VDC	0V.	0V.	0V.
	V3	6BE6	†-6.6VDC	0V.	0V.	6.3VAC	165VDC	100VDC	-.5VDC	
	V4	6BA6	-.1VDC	0V.	0V.	6.3VAC	150VDC	110VDC	1VDC	
†	V5	6BA6	0V.	0V.	0V.	6.3VAC	125VDC	110VDC	1VDC	
	V6A	6T8	0V.	-.8VDC	0V.	0V.	6.3VAC	-.6VDC	0V.	-.6VDC	55VDC
†	V6B	6T8	-.3VDC	-.8VDC	-.3VDC	0V.	6.3VAC	0V.	0V.	-.6VDC	55VDC
	V7	6AQ5	0V.	6.3VDC	0V.	6.3VAC	175VDC	140VDC	0V.	
	V8	6X4	180VAC	†140VDC	0V.	6.3VAC	187VDC	190VAC	195VDC	

† TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
	V1	6BA6	100KΩ	0Ω	0Ω	1Ω	†2KΩ	†28KΩ	68Ω	
†	V2	12AT7	12KΩ	22KΩ	2Ω	1Ω	1Ω	†2KΩ	0Ω	2.2KΩ	0Ω
	V3	6BE6	22KΩ	5Ω	0Ω	1Ω	†1000Ω	19.2KΩ	1.5 Meg.	
	V4	6BA6	2.5 Meg.	0Ω	0Ω	1Ω	†2KΩ	†12KΩ	68Ω	
†	V5	6BA6	100KΩ	0Ω	0Ω	1Ω	†2KΩ	15.5KΩ	68Ω	
	V6A	6T8	Inf.	15KΩ	Inf.	0Ω	1Ω	500KΩ	0Ω	10 Meg.	330KΩ
†	V6B	6T8	500KΩ	15KΩ	500KΩ	0Ω	1Ω	Inf.	0Ω	10 Meg.	330KΩ
	V7	6AQ5	470KΩ	270Ω	0Ω	1Ω	†270Ω	†100KΩ	470KΩ		
	V8	6X4	180Ω	††1000Ω	0Ω	1Ω	55KΩ	[illegible]	60KΩ		

† TAKEN IN FM POSITION.

† MEASURED FROM PIN 7 OF V8.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap fully closed and set pointer parallel with base of dial.

AM ALIGNMENT

To insure control should be in maximum position. Use lowest output signal necessary for an accurate output reading. Use an insulated alignment screwdriver for adjusting all tuning slugs. The signal generator should be no higher than necessary to obtain an output reading.

ITEM No.	USE	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO SETTING	OUTPUT METER	REMARKS
A1	IF Amp.	.05MFD	High side to pin 7 (6BE8) Low side to chassis.	455KC (465 - Mod.)	AM (CCW)	Tune for max. output	Across voice coil	Adjust for maximum output.
A2	RF Amp.	"	Loop	1650KC	"	Tune for max. output	"	"
A3	Converter	"	Loop	600KC	"	"	"	"
A4	Osc.	"	"	1400KC	"	"	"	"
A5	Ant.	"	"	1650KC	"	Tuning gang fully open	"	"
A6	Det. & 1st Audio	"	"	1000KC	"	"	"	"
A7, A8	Output	"	"	400CPS	"	"	"	"

Connect two matched 100KΩ (±1%) resistors in series from point A to chassis. The junction of these two resistors is to be connected to the DC Probe of the Vacuum Tube Voltmeter. Use the 10 Volt DC scale for all measurements. Set the Function Switch to the DC Position. Use the common lead for all measurements.

Position loop of several turns of wire and suitable signal into loop of receiver. Adjust for maximum output. Adjust rod antenna coil for maximum output. Repeat steps 3 and 4 until no further improvement can be made.

Position loop of several turns of wire and suitable signal into loop of receiver. Adjust for maximum output. Adjust rod antenna coil for maximum output. Repeat steps 3 and 4 until no further improvement can be made.

FM RF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

ITEM No.	USE	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO SETTING	CONNECT VTVM	REMARKS
A1	IF Amp.	.005MFD	DC Probe to Point (5) (6AL5) Common to chassis.	10.7MC (Sweep)	FM (center)	Tune for max. output	DC Probe to Point (5) (6AL5) Common to chassis.	Adjust for zero reading. A positive and negative reading will be obtained. Refer to the one closer to zero for the correct setting.
A2	RF Amp.	"	"	98MC	"	Tuning gang fully open	"	"
A3	Converter	"	"	90MC	"	"	"	"
A4	Osc.	"	"	101MC	"	"	"	"
A5	Ant.	"	"	98MC	"	"	"	"
A6	Det. & 1st Audio	"	"	90MC	"	"	"	"
A7, A8	Output	"	"	400CPS	"	"	"	"

Connect two matched 100KΩ (±1%) resistors in series from point A to chassis. The junction of these two resistors is to be connected to the DC Probe of the Vacuum Tube Voltmeter. Use the 10 Volt DC scale for all measurements. Set the Function Switch to the DC Position. Use the common lead for all measurements.

FM RF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

ITEM No.	USE	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO SETTING	CONNECT SCOPE	REMARKS
A1	IF Amp.	.005MFD	High side to pin 7 (6BE8) Low side to chassis.	10.7MC (Sweep)	FM (center)	Tune for max. output	Vert. Amp. to Point (5) (6AL5) Low side to chassis.	Disconnect stabilizer capacitor C3. Adjust all 10.7MC circuits as per Table 1. Reconnect capacitor C3. Adjust A1 as 10.7MC occurs at center of response curve as shown in SLIGHTLY rounds. At for maximum amplitude and straightness & symmetry. Loop
A2	RF Amp.	"	"	98MC	"	Tuning gang fully open	"	"
A3	Converter	"	"	90MC	"	"	"	"
A4	Osc.	"	"	101MC	"	"	"	"
A5	Ant.	"	"	98MC	"	"	"	"
A6	Det. & 1st Audio	"	"	90MC	"	"	"	"
A7, A8	Output	"	"	400CPS	"	"	"	"

Time frequency modulated signal with 60c modulation and 455KC sweep. Use 120 - sawtooth voltage in scope for horizontal deflection.

FIG. 1

FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	FM RF Amp.		6BA6	7BK	
V2	FM Converter		12AT7	9A	
V3	AM Converter		6BE6	7CH	
V4	1st IF Amp.		6BA6	7BK	
V5	2nd FM IF Amp.		6BA6	7BK	
V6	DET-AVC-AF		6T8	9K	
V7	Power Output		6AQ5	7BZ	
V8	Rectifier		6X4	5B	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	20	250	N22601	AF844F	UP42225		EL-354	■ Filter
B	20	250						▲ Filter
C	20	250						Filter
C2	10	25	N22602	PRS25110	BR102A		TA-10	Output Cathode Bypass.
C3	4	25	N22659	PRS150/4	BR150		TA-5	Stabilizing Cap.
C4	47			GP47M	5W5Q5	GP1K-47	1FM-45	RF Coupling.
C5	5000			BPD-5	1D5D5	81L-005	29C1	FM RF Cathode Bypass.
C6	10000			BPD-10	PTE48I	82I-01	36C1	FM RF Screen Bypass.
C7	1000			GP1000M	1W5D1	GP2L-001	1FM-21	FM RF Decoupling.
C8	100			GP100M	5W5T1	GP1K-100	1FM-31	RF Coupling.
C9	1000			GP1000M	1W5D1	GP2L-001	1FM-21	Mixer Cathode Bypass.
C10	1.5					NPOK-1.5		Osc. Coupling.
C11	50			GP50M	5W5Q5	GP1K-50	1FM-45	Osc. Grid Cap.
C12	5-25		N22724			NPO-5S7-5-25		Variable Trimmer
C13	1000			GP1000M	1W5D1	GP2L-001	1FM-21	Osc. Plate Bypass.
C14	47			GP47M	5W5Q5	GP1K-47	1FM-45	Osc. Grid Cap.
C15	01	400		P488-01	PTE48I	82I-01	TM-11	Osc. Anode Bypass.
C16	05	200		P288-05	PTE48S		TM-15	AVC Filter
C17	5000			BPD-5	1D5D5	81L-005	29C1	AVC Filter
C18	1000			GP1000M	1W5D1	GP2L-001	1FM-21	AVC Filter.
C19	1000			GP1000M	1W5D1	GP2L-001	1FM-21	FM Mixer Plate Dec.
C20	5000			BPD-5	1D5D5	81L-005	29C1	1st IF Cathode Bypass.
C21	10000			BPD-10	PTE48I	82I-01	36C1	1st IF Screen Bypass.
C22	5000			BPD-5	1D5D5	81L-005	29C1	1st IF Decoupling.
C23	15			GP15M	5W5Q2	GP1K-15	MS-415	IF Coupling.
C24	5000			BPD-5	1D5D5	81L-005	29C1	2nd IF Cathode Bypass.
C25	10000			BPD-10	PTE48I	82I-01	36C1	2nd IF Screen Bypass.
C26	5000			BPD-5	1D5D5	81L-005	29C1	2nd IF Decoupling.
C27	100			GP100M	5W5T1	GP1K-100	1FM-31	Diode Load Cap. - See Note.
C28	100			GP100M	5W5T1	GP1K-100	1FM-31	Diode Load Cap. - See Note.
C29	003	600		P588-003	PTE5D3	GP3M-003	TM-23	De-emphasis
C30	100			GP100M	5W5T1	GP1K-100	1FM-31	Diode RF Filter.
C31	01	400		P488-01	PTE48I	82I-01	TM-11	Audio Coupling.
C32	220			GP220M	5W5T25	GP2K-220	1FM-225	AF Amp. Grid Bypass
C33	100			GP100M	5W5T1	GP1K-100	1FM-31	AF Amp. Plate Bypass.
C34	005	600		P588-005	PTE5D5	81L-005	TM-25	Audio Coupling.
C35	01	400		P488-01	PTE48I	82I-01	TM-11	Output Plate Bypass.
C36	01	400		P488-01	PTE48I	82I-01	TM-11	Line Filter.

Note. When either item C27 nor C28 are replaced, replace both with capacitors of equal value.

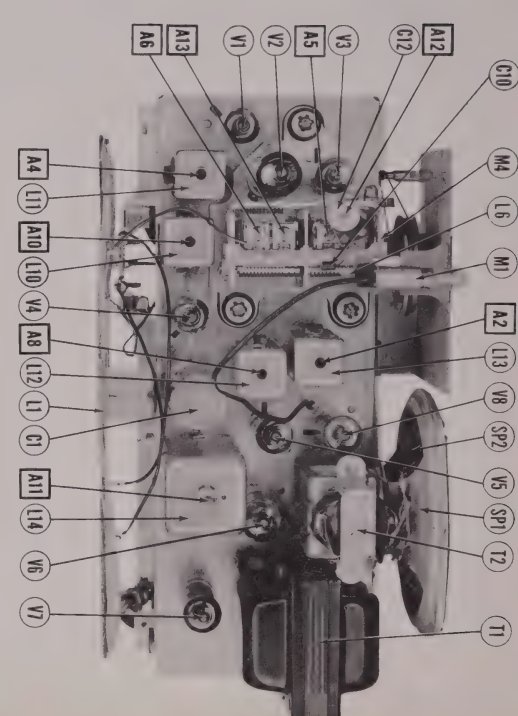
SET 69

CONTROLS

FOLDER 14

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	500KΩ	½	22603	Q13-133	M-60-Z	Volume Control.
B	Switch		Not Req.	76-1	SW-A	Attach to R1A per instructions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R2	68Ω	½			FM RF Cathode.
R3	27KΩ	1		BTA-27K	FM RF Screen.
R4	1000Ω	½		BTS-1000	FM RF Decoupling.
R5	2200Ω	½		BTS-2200	FM Conv. Cathode.
R6	1000Ω	½		BTS-1000	FM Conv. Plate Decoupling.
R7	22KΩ	½		BTS-22K	FM Osc. Grid.
R8	1000Ω	½		BTS-1000	FM Osc. Plate.
R9	470	½			Parasitic Supp.
R10	22KΩ	1		BTS-22K	AM Osc. Grid.
R11	8200	1		BTA-8200	AM Osc. Anode.
R12	1 Meg.	½		BTS-1 Meg.	AVC Network.
R13	68Ω	½			1st IF Cathode.
R14	10KΩ	1		BTA-10K	1st IF Screen.
R15	1000Ω	½		BTS-1000	1st IF Decoupling.
R16	100KΩ	½		BTS-100K	FM 2nd IF Grid.
R17	68Ω	½			FM 2nd IF Cathode.
R18	3300Ω	1		BTA-3300	FM 2nd IF Screen
R19	1000Ω	½		BTS-1000	FM 2nd IF Decoupling.
R20	1 Meg.	½		BTS-1 Meg.	AVC Network.
R21	220KΩ	½		BTS-220K	AVC Network.
R22	100KΩ	½		BTS-100K	AVC Network.
R23	180Ω	½			Balancing.
R24	39KΩ	½		BTS-39K	De-emphasis
R25	15KΩ	½		BTS-15K	Ratio Det. Diode Load.
R26	10 Meg.	½		BTS-10 Meg.	AF Grid.
R27	330KΩ	½		BTS-330K	AF Plate.
R28	470KΩ	½		BTS-470K	Output Grid.
R29	270Ω	1		BW-1-270	Output Cathode.
R30A	500Ω	5	N22624	ABA-1000*	Filter Wire Wound.
B	500Ω				Filter Wire Wound.

* Set slider at 300Ω from one end.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T2	7.5KΩ	3.7Ω	270Ω	.3Ω	N22588		A-2927	RO-13	

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC at .38A	380VCT at .052A	6.3VAC at 3.2A		N22589	P-8119 #	P-3948#	

Add series resistor to reduce plate voltage . Mount vertically with universal mounting brackets.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	INSTALLATION NOTES
SP1	FIELD	V. C. IMP.		N22760	ST-105 † Mod. P5-X	5A1 †	† Remount Output transformer.
	PM	3.7Ω					
SP2	CONE DIA.	V. C. DIA.					
	4 1/2"	9/16"					

PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: MEISSNER PART No.
L1	AM Loop Ant.	0Ω	2Ω	N22586	
L2	RF Choke	.1Ω		N22648	
L3	RF Choke	1Ω		N21645	
L4	FM RF Coil	0Ω		N22593	
L5	RF Choke	.2Ω		N22597-1	
L6	FM Osc. Coil	0Ω		N22594	
L7	AM Osc. Coil	.5Ω	7Ω	N22587	14-1073
L8	Parasitic Supp.	0Ω		N22334-1	
L9	Parasitic Supp.	0Ω		N22335-1	
L10	1st FM IF	1Ω	1Ω	N22590	
L11	1st AM IF	10Ω	10Ω	N22352-1	16-6678
L12	2nd FM IF	.8Ω		N22591	
L13	2nd AM IF	10Ω	10Ω	N22352-1	16-6678
L14	Ratio Det. Tran.	1Ω	1Ω	N22592	
L15	Fil. Choke	.5Ω		N21673	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: SILVERTONE PART No.	NOTES
M1	Bayonet	6-8	.15	Brown		Type #47

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: ASTATIC PART No. CARTRIDGE	REPLACEMENT DATA: ASTATIC PART No. NEEDLE	REPLACEMENT DATA: SHURE PART No. CARTRIDGE	REPLACEMENT DATA: SHURE PART No. NEEDLE	REMARKS
M2	N66697	L-70A		W57A		Use standard needle.

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Switch	N22748	Band - Phono
M4	2 Gang Var. Cap.	N22800	(20-383MMF, 31-179MMF)
	Dial Crystal	N22752	
	Knob	N22804-4A	On/Off - Volume
	Knob	N22804-4B	Band - Phono
	Knob	N22804-4C	Tuning
	Dial Pointer	N19226-2	
	Dial Scale	N22581	

PHOTOFACT* Folder

U. S. TELEVISION
T-10823

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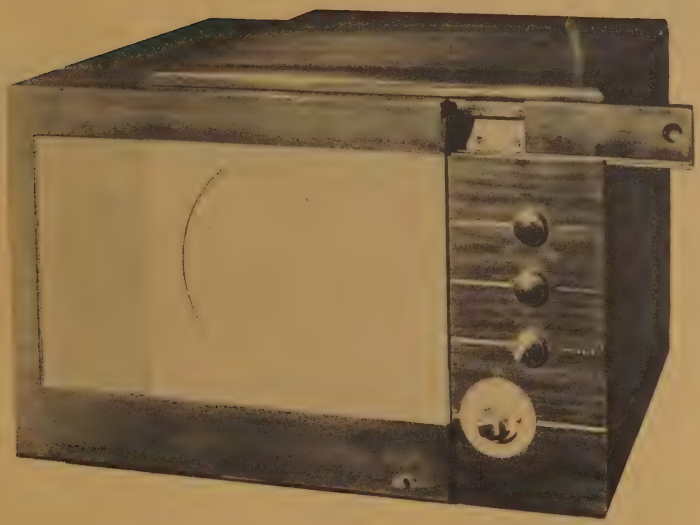
Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



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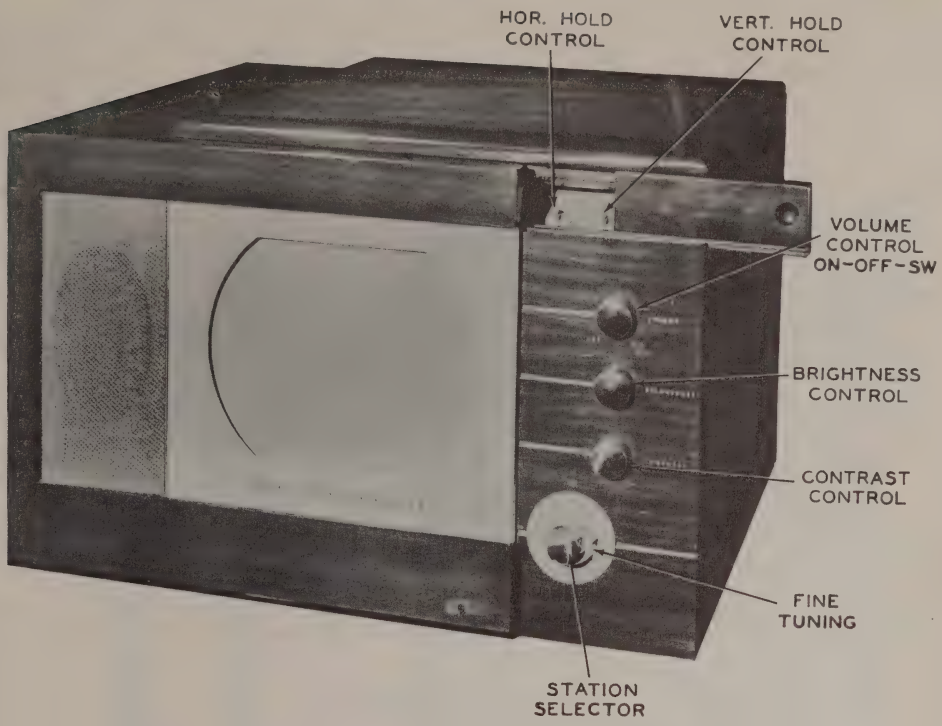

U. S. TELEVISION
MODEL T-10823

TRADE NAME	U. S. T. Model T-10823
MANUFACTURER	United Stated Television Mfg.. Corp., 3 W. 61st St., New York, New York
TYPE SET	Television Receiver
TUBES	Twenty Five
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	2.6 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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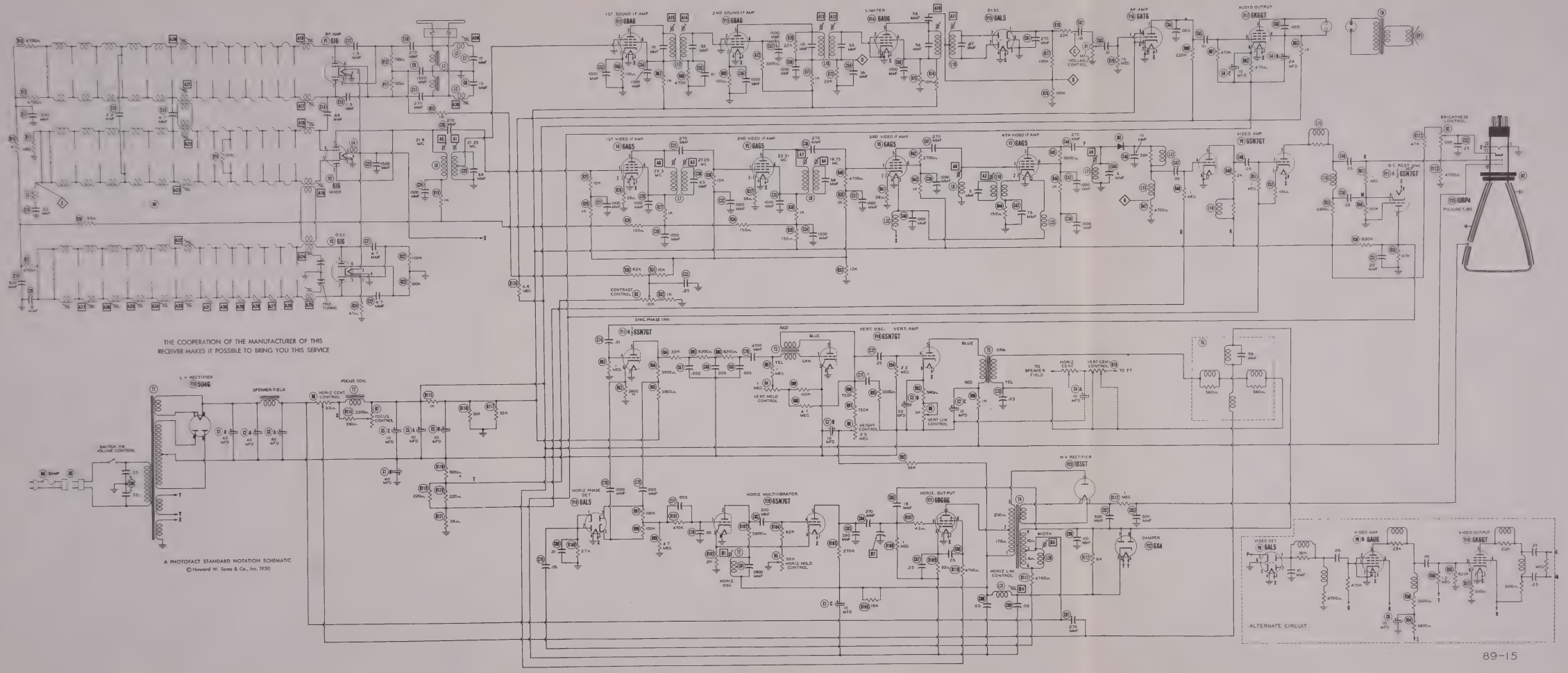
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RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
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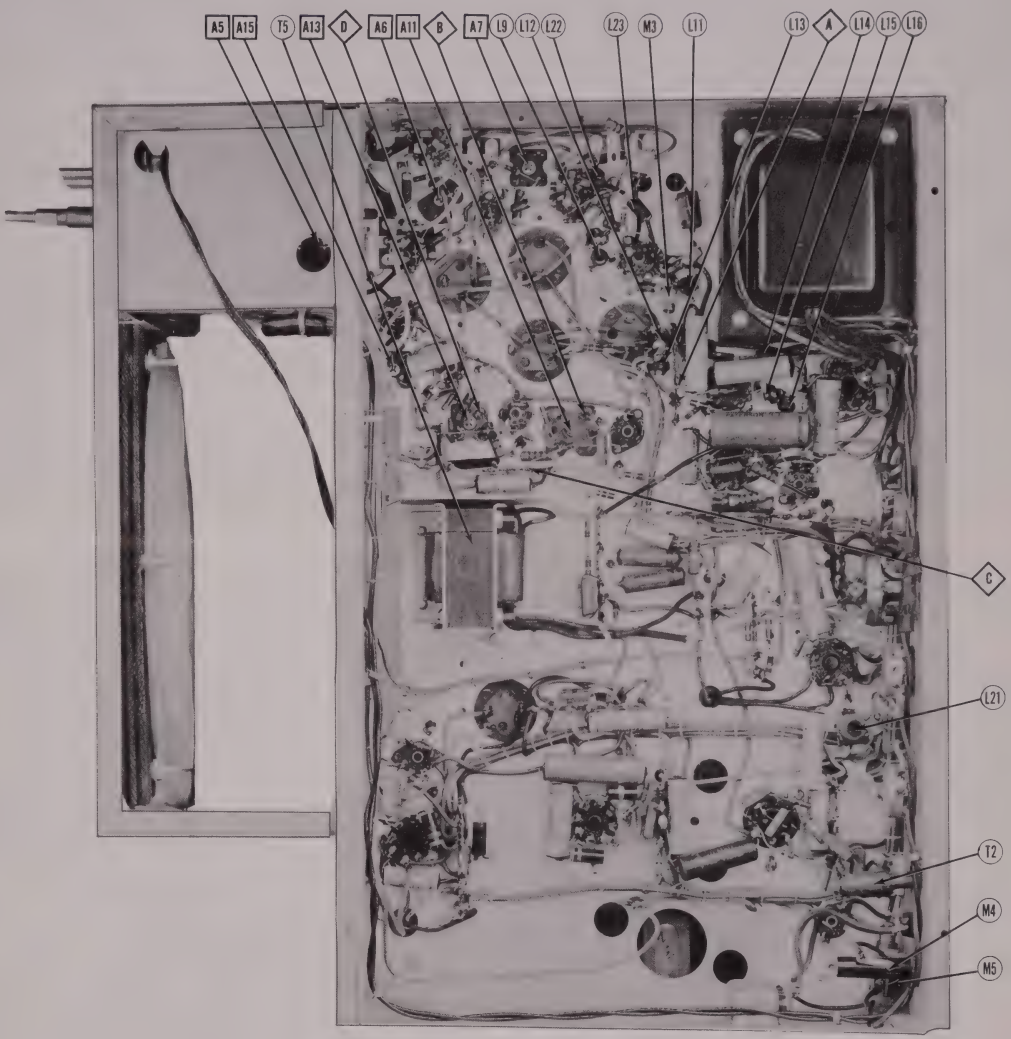
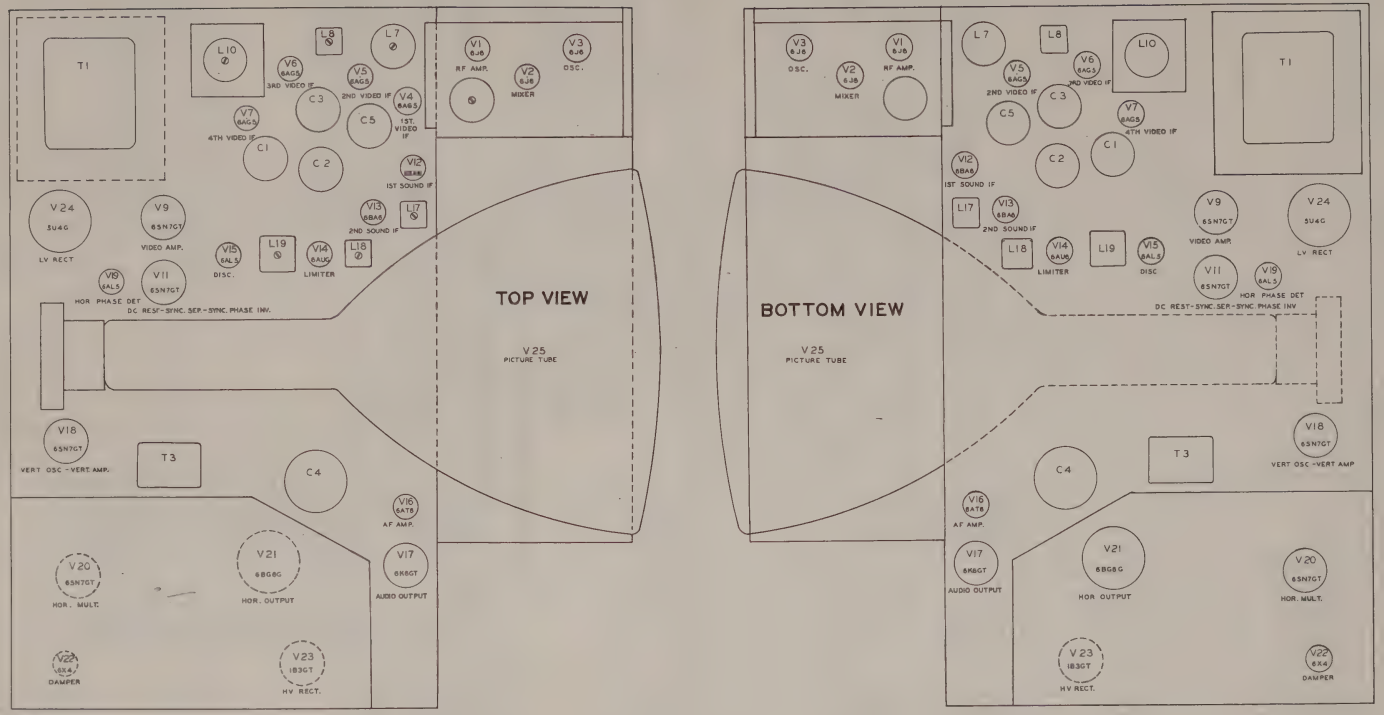
ALTERNATE CIRCUIT
89-15

CHASSIS TOP VIEW

U. S. TELEVISION
MODEL T-10823



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V20) from its socket.

VIDEO IF ALIGNMENT

If the set has an RCA Tuner, remove the local oscillator tube (V3) to prevent erroneous indications. If the set has a Standard Coil Tuner, remove the channel 13 segment of the converter section of the tuner turret, and turn the channel switch to channel 13 to disable the local oscillator.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	21.25MC (Unmod.)	13	DC Probe to Point (A) Common to chassis.	A1, A2	Adjust for MINIMUM deflection.
2.	Direct	"	27.25MC	"	"	A3	"
3.	Direct	"	19.75MC	"	"	A4	"
4.	Direct	"	21.8MC	"	"	A5	Adjust for maximum deflection.
5.	Direct	"	25.3MC	"	"	A6	"
6.	Direct	"	22.3MC	"	"	A7	"
7.	Direct	"	25.2MC	"	"	A8	"
8.	Direct	"	23.4MC	"	"	A9	"

OVERALL VIDEO IF RESPONSE CHECK

See instructions under Video IF Alignment.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	24MC (10MC SWP)	19.75MC 21.25MC 22MC 25.75MC 27.25MC	13	Vert. Amp. to Point (A) Low side to chassis.		Check for response curve similar to Fig 1. If necessary retouch A1 thru A9 for optimum response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V14). Low side to chassis.	21.25MC (Unmod.)	13	DC Probe to Point (B) Common to chassis.	A10	Adjust for maximum deflection.
11.	.01MFD	"	"	"	DC Probe to Point (C) Common to chassis.	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
12.	.01MFD	High side to pin 1 (Grid) of 6BA6 (V12). Low side to chassis.	"	"	DC Probe to Point (D) Common to chassis.	A12, A13, A14, A15	Adjust for maximum deflection.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

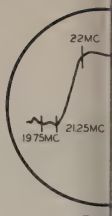
Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.01MFD	High side to pin 1 (Grid) of 6BA6 (V12). Low side to chassis.	21.25MC (1MC SWP)	21.25MC	13	Vert. Amp. to Point (D) Low side to chassis.	A12, A13, A14, A15	Adjust for maximum amplitude and symmetry as per Fig 2.
11.	.01MFD	"	"	"	"	Vert. Amp. to Point (C) Low side to chassis.	A10, A11	Adjust A11 so 21.25MC occurs at center of crossover lines as per Fig 3. Adjust A10 for maximum amplitude and straightness of crossover lines. Continue with step 13.

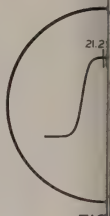
RF AND MIXER ALIGNMENT (RCA TUNER)

Replace the local oscillator tube (V3).
Connect a 1000MMF capacitor from the grid of the first video IF Amp., (V4) to chassis, using the shortest possible leads.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 125Ω carbon res.	Across antenna terminals with 125Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to Point (E) Low side to chassis.	A16, A17 A18, A19	Adjust for response curve similar to Fig 4 with markers above 70%.
14.	"	"	207MC (10MC SWP)	205.25MC 209.75MC	12	"		Check for response curve similar to Fig 4. If markers are below 70% on any channel make slight adjustment of A16, A17, A18, A19, with channel selector set for that channel. Recheck all high band channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
15.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A20, A21, A22, A23	Adjust for response curve similar to Fig 4 with markers above 70%.
16.	"	"	79MC (10MC SWP)	77.25MC 81.75MC	5	"		Check for response curve similar to Fig 4. If markers are below 70% on any channel make slight adjustment of A20, A21, A22 and A23 with channel selector set for that channel. Recheck all low band channels to see that they have not been seriously effected.
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			



FIG



FIG

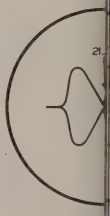


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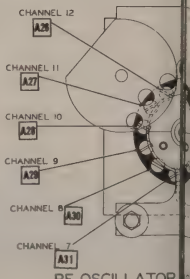
FIG



RF OSCILLATOR (RCA

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V20) from its socket.

VIDEO IF ALIGNMENT

If the set has an RCA Tuner, remove the local oscillator tube (V3) to prevent erroneous indications. If the set has a Standard Coil Tuner, remove the channel 13 segment of the converter section of the tuner turret, and turn the channel switch to channel 13 to disable the local oscillator.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	21.25MC (Unmod.)	13	DC Probe to Point A Common to chassis.	A1, A2	Adjust for MINIMUM deflection.
2	Direct	"	27.25MC	"	"	A3	"
3	Direct	"	19.75MC	"	"	A4	"
4	Direct	"	21.8MC	"	"	A5	Adjust for maximum deflection.
5.	Direct	"	25.3MC	"	"	A6	"
6.	Direct	"	22.3MC	"	"	A7	"
7	Direct	"	25.2MC	"	"	A8	"
8	Direct	"	23.4MC	"	"	A9	"

OVERALL VIDEO IF RESPONSE CHECK

See instructions under Video IF Alignment.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	24MC (10MC SWP)	19.75MC 21.25MC 22MC 25.75MC 27.25MC	13	Vert. Amp. to Point A Low side to chassis.		Check for response curve similar to Fig 1. If necessary retouch A1 thru A9 for optimum response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V14). Low side to chassis.	21.25MC (Unmod.)	13	DC Probe to Point B Common to chassis.	A10	Adjust for maximum deflection.
11.	.01MFD	"	"	"	DC Probe to Point B Common to chassis.	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
12.	.01MFD	High side to pin 1 (Grid) of 6BA6 (V12). Low side to chassis.	"	"	DC Probe to Point B Common to chassis.	A12, A13, A14, A15	Adjust for maximum deflection.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.01MFD	High side to pin 1 (Grid) of 6BA6 (V12). Low side to chassis.	21.25MC (1MC SWP)	21.25MC	13	Vert. Amp. to Point A Low side to chassis.	A12, A13, A14, A15	Adjust for maximum amplitude and symmetry as per Fig 2.
11.	.01MFD	"	"	"	"	Vert. Amp. to Point A Low side to chassis.	A10, A11	Adjust A11 so 21.25MC occurs at center of crossover lines as per Fig 3. Adjust A10 for maximum amplitude and straightness of crossover lines. Continue with step 13.

RF AND MIXER ALIGNMENT (RCA TUNER)

Replace the local oscillator tube (V3).
Connect a 1000MMF capacitor from the grid of the first video IF Amp., (V4) to chassis, using the shortest possible leads.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 125Ω carbon res.	Across antenna terminals with 125Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to Point B Low side to chassis.	A16, A17 A18, A19	Adjust for response curve similar to Fig 4 with markers above 70%.
14.	"	"	207MC (10MC SWP) 201MC (10MC SWP) 195MC (10MC SWP) 189MC (10MC SWP) 183MC (10MC SWP) 177MC (10MC SWP)	209.75MC 203.75MC 197.75MC 191.75MC 185.75MC 179.75MC	12 11 10 9 8 7	"		Check for response curve similar to Fig 4. If markers are below 70% on any channel make slight adjustment of A16, A17, A18, A19, with channel selector set for that channel. Recheck all high band channels to see that they have not been seriously effected.
15.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A20, A21, A22, A23	Adjust for response curve similar to Fig 4 with markers above 70%.
16.	"	"	73MC (10MC SWP) 67MC (10MC SWP) 61MC (10MC SWP) 55MC (10MC SWP)	77.25MC 81.75MC 67.25MC 71.75MC 61.25MC 65.75MC 55.25MC 59.75MC	5 4 3 2	"		Check for response curve similar to Fig 4. If markers are below 70% on any channel make slight adjustment of A20, A21, A22 and A23 with channel selector set for that channel. Recheck all low band channels to see that they have not been seriously effected.

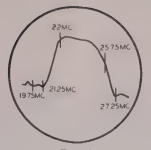


FIG. 1

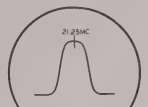


FIG 2

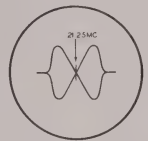


FIG 3

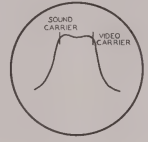
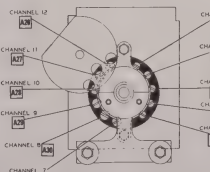


FIG 4



RF OSCILLATOR ALIGNMENT POINTS (RCA TUNER)

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT (RCA TUNER)

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
17.	Two 125Ω carbon res.	Across antenna terminals with 125Ω in each lead.	215.75MC (Unmod.)	13	DC Probe to Point A Common to chassis.	A24, A25	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Keep slug pairs at approximately the same relative position.
18.	"	"	209.75MC	13	"	A26	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
			203.75MC	11		A27	
			197.75MC	10		A28	
			191.75MC	9		A29	
			185.75MC	8		A30	
			179.75MC	7		A31	
19.	"	"	87.75MC	6	"	A32, A33	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Keep slug pairs at approximately the same relative position.
20.	"	"	81.75MC	5	"	A34	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
			71.75MC	4		A35	
			65.75MC	3		A36	
			59.75MC	2		A37	

WAVE TRAP ADJUSTMENT (RCA TUNER)

Wave traps A38 and A39 are used for specific types of interference and their alignment will depend upon the type encountered. With the receiver tuned to the channel having the interference set fine tuning control until interference is at maximum. Adjust A38 and A39 for minimum interference in the picture and sound, keeping the cores at approximately the same relative position. Turn one core 1/2 turn, adjust the other for minimum interference.

RF AND MIXER ALIGNMENT (STD. COIL TUNER)

Replace the channel 13 segment of the tuner turret.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 125Ω carbon res.	Across antenna terminals with 125Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to Point A Low side to chassis.	A501, A502, A503	Adjust for response curve similar to Fig 4 with markers above 70%.
14.	"	"	213MC (10MC SWP) 207MC (10MC SWP) 201MC (10MC SWP) 195MC (10MC SWP) 189MC (10MC SWP) 183MC (10MC SWP) 177MC (10MC SWP) 171MC (10MC SWP) 165MC (10MC SWP) 159MC (10MC SWP) 153MC (10MC SWP) 147MC (10MC SWP) 141MC (10MC SWP) 135MC (10MC SWP) 129MC (10MC SWP) 123MC (10MC SWP)	211.25MC 215.75MC 199.25MC 203.75MC 193.25MC 197.75MC 187.25MC 191.75MC 181.25MC 185.75MC 175.25MC 179.75MC 169.25MC 173.75MC 163.25MC 167.75MC 157.25MC 161.75MC 151.25MC 155.75MC 145.25MC 149.75MC 139.25MC 143.75MC 133.25MC 137.75MC 127.25MC 131.75MC 121.25MC 125.75MC	13 11 10 9 8 7 6 5 4 3 2	"		Check for response curve similar to Fig 4 with markers above 70%. Check for response curve similar to Fig 4. If optimum response is desired for any channel, make slight adjustment of A501, A502, A503 with channel selector set for that channel. Recheck all channels to see that they have not been seriously effected.

OSCILLATOR ALIGNMENT (STD. COIL TUNER)

Complete oscillator alignment may not be necessary. If all channels seem to be off frequency approximately the same amount, for a majority of the channels, it may be possible to correct them in one step using A504. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A504 will not bring all channels within the range of the fine tuning control, it will be necessary to use the individual channel oscillator adjustment for each channel that is off frequency.
The individual oscillator adjustments are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel selector switch is turned to each channel.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
15.	Two 125Ω carbon res.	Across antenna terminals with 125Ω in each lead.	215.75MC (Unmod.)	13	DC Probe to Point A Common to chassis.	A505	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
			209.75	12		A506	
			203.75MC	11		A507	
			197.75MC	10		A508	
			191.75MC	9		A509	
			185.75MC	8		A510	
			179.75MC	7		A511	
			87.75MC	6		A512	
			81.75MC	5		A513	
			71.75MC	4		A514	
			65.75MC	3		A515	
			59.75MC	2		A516	

U. S. TELEVISION
MODEL T-10823

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	70VDC	70VDC	6.3VAC	0V.	-.4VDC	-.4VDC	0V.		
V 2	6J6	95VDC	95VDC	6.3VAC	0V.	-1.6VDC	-3.2VDC	0V.		
V 3	6J6	50VDC	50VDC	6.3VAC	0V.	§-3.4VDC	§-3.7VDC	.2VDC		
V 4	6AG5	-1VDC	.4VDC	6.3VAC	0V.	100VDC	100VDC	.4VDC		
V 5	6AG5	-.9VDC	.2VDC	6.3VAC	0V.	105VDC	105VDC	.2VDC		
V 6	6AG5	-1VDC	.3VDC	6.3VAC	0V.	95VDC	110VDC	.3VDC		
V 7	6AG5	0V.	1.5VDC	6.3VAC	0V.	70VDC	110VDC	1.5VDC		
V 8	6AL5									
V 9	6SN7GT	#-1.5VDC	#185VDC	#1.2VDC	-1.8VDC	110VDC	0V.	0V.	6.3VAC	
V 10	6K6GT									
V 11	6SN7GT	0V.	3VDC	13VDC	0V.	105VDC	5.2VDC	0V.	6.3VAC	
V 12	6BA6	0V.	0V.	6.3VAC	0V.	100VDC	100VDC	1.6VDC		
V 13	6BA6	0V.	0V.	6.3VAC	0V.	105VDC	105VDC	1.5VDC		
V 14	6AU6	-.5VDC	0V.	6.3VAC	0V.	50VDC	50VDC	0V.		
V 15	6AL5	0V.	-.1VDC	6.3VAC	0V.	0V.	0V.	-.4VDC		
V 16	6AT6	-.4VDC	0V.	6.3VAC	0V.	-.4VDC	0V.	80VDC		
V 17	6K6GT	0V.	6.3VAC	#290VDC	#310VDC	#0V.	#0V.	0V.	#20VDC	
V 18	6SN7GT	#-10VDC	#55VDC #110VDC	#0V.	#0V.	#320VDC	#15.5VDC #8VDC	6.3VAC	0V.	
V 19	6AL5	0V.	0V.	6.3VAC	0V.	2VDC	0V.	1.2VDC		
V 20	6SN7GT	.1VDC	225VDC	9.5VDC	-.2VDC	130VDC	9.5VDC	6.3VAC	0V.	
V 21	6BG6G	0V.	6.3VAC	#12.5VDC	0V.	#0V.	#350VDC	0V.	#280VDC	TOP CAP *
V 22	6X4	275VDC	0V.	♦0V.	♦0V.	0V.	275VDC	280VDC		
V 23	1B3GT	* DO NOT MEASURE								
V 24	5U4G	0V.	300VDC	117VAC	#400VAC	6.3VAC	#400VAC	6.3VAC	300VDC	
V 25	10BP4	0V.	11VDC	PIN 10 225VDC	PIN 11 70VDC	PIN 12 6.3VAC				

§ TAKEN WITH VACUUM TUBE VOLTMETER.
# MEASURED FROM PIN 3 OF V18.
♦ 6.3VAC MEASURED ACROSS FILAMENTS.
* DO NOT MEASURE.
NOTE: CONTRAST CONTROL SET AT MAXIMUM FOR THESE MEASUREMENTS.

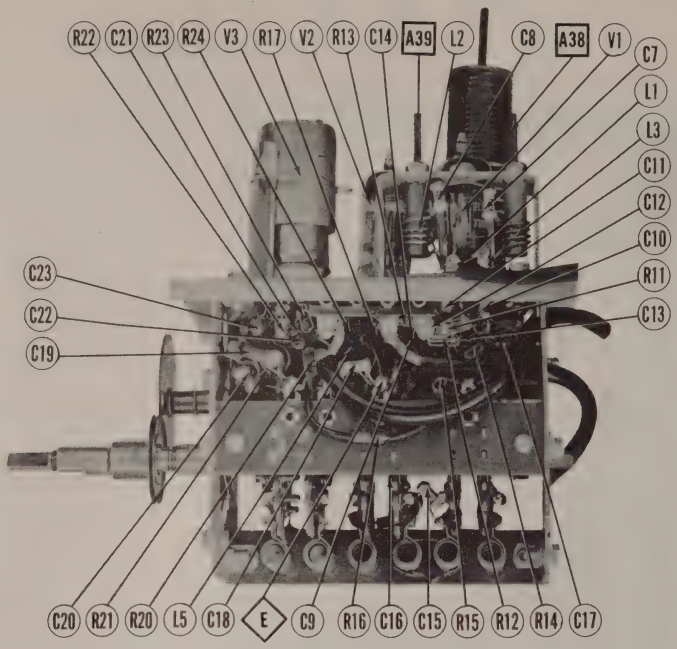
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	†6KΩ	†6KΩ	.1Ω	0Ω	85KΩ	85KΩ	0Ω		
V 2	6J6	†3KΩ	†3KΩ	.1Ω	0Ω	1 Meg.	1 Meg.	0Ω		
V 3	6J6	†7KΩ	†7KΩ	.1Ω	0Ω	100KΩ	100KΩ	47Ω		
V 4	6AG5	15KΩ	39Ω	.1Ω	0Ω	†2.5KΩ	†2.5KΩ	39Ω		
V 5	6AG5	15KΩ	39Ω	.1Ω	0Ω	†2.4KΩ	†2.4KΩ	39Ω		
V 6	6AG5	11KΩ	39Ω	.1Ω	0Ω	†5KΩ	†2.2KΩ	39Ω		
V 7	6AG5	.1Ω	150Ω	.1Ω	0Ω	†7.6KΩ	†2.2KΩ	150Ω		
V 8	6AL5									
V 9	6SN7GT	1 Meg.	†4.5KΩ	#100 Ω	1 Meg.	†3.3KΩ	0Ω	0Ω	.1Ω	
V 10	6K6GT									
V 11	6SN7GT	0Ω	†600KΩ	150KΩ	1 Meg.	†9KΩ	4KΩ	0Ω	.1Ω	
V 12	6BA6	0Ω	0Ω	.1Ω	0Ω	†2.5KΩ	†2.5KΩ	100Ω		
V 13	6BA6	470KΩ	0Ω	.1Ω	0Ω	†2.5KΩ	†4.8KΩ	100Ω		
V 14	6AU6	22KΩ	0Ω	.1Ω	0Ω	†8KΩ	†8KΩ	0Ω		
V 15	6AL5	200KΩ	100KΩ	.1Ω	0Ω	0Ω	0Ω	100KΩ		
V 16	6AT6	15 Meg.	0Ω	.1Ω	0Ω	100KΩ	Inf.	†220KΩ		
V 17	6K6GT	Inf.	.1Ω	†2KΩ	†1.5KΩ	#470KΩ	#0Ω	0Ω	#470Ω	
V 18	6SN7GT	#2 Meg.	†2.4 Meg †1.2 Meg.	#0Ω	#2.2 Meg.	†2KΩ	#5.5KΩ #560Ω	.1Ω	0Ω	
V 19	6AL5	27KΩ	27KΩ	.1Ω	0Ω	4.8 Meg.	Inf.	4.8 Meg.		
V 20	6SN7GT	5 Meg.	†12KΩ	2KΩ	130KΩ	†270KΩ	2KΩ	.1Ω	0Ω	
V 21	6BG6G	Inf.	.1Ω	#82Ω	Inf.	1 Meg.	†230Ω	0Ω	†4.7KΩ	TOP CAP †6KΩ
V 22	6X4	†85Ω	Inf.	Inf.	Inf.	Inf.	†65Ω	†6KΩ		
V 23	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP †6KΩ
V 24	5U4G	Inf.	8KΩ	#0Ω	#26Ω	0Ω	#28Ω	0Ω	8KΩ	
V 25	10BP4	0Ω	1.1Meg.	PIN 10 †230Ω	PIN 11 27KΩ	PIN 12 .1Ω				

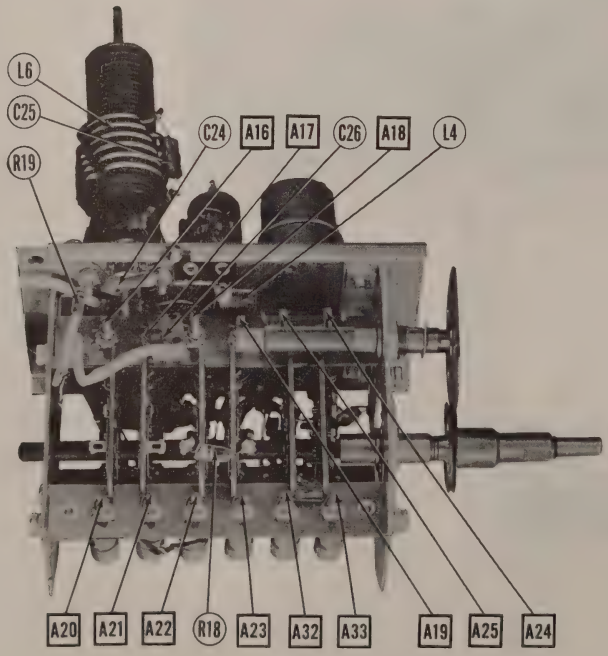
† MEASURED FROM PIN 8 OF V24.
# MEASURED FROM PIN 3 OF V18.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

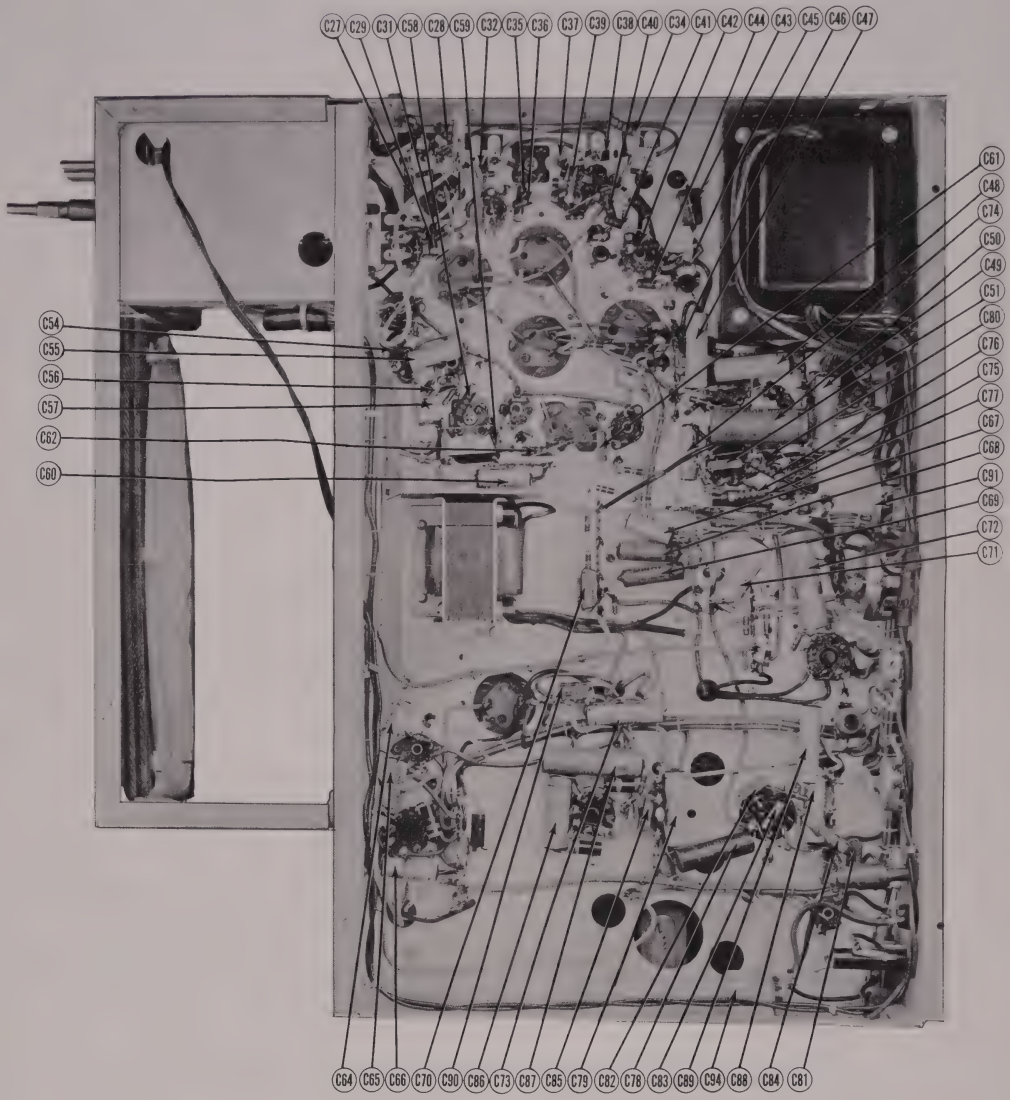
CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION

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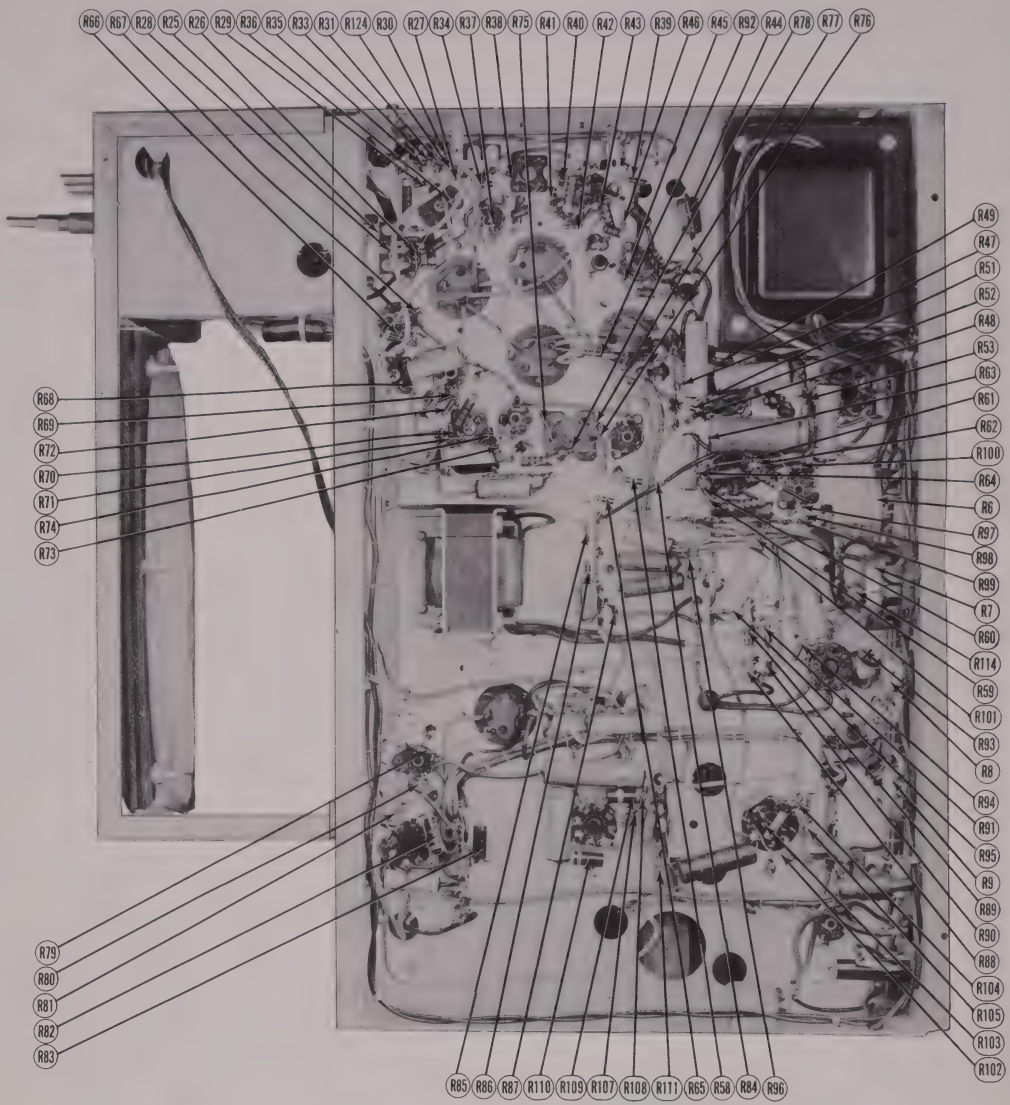
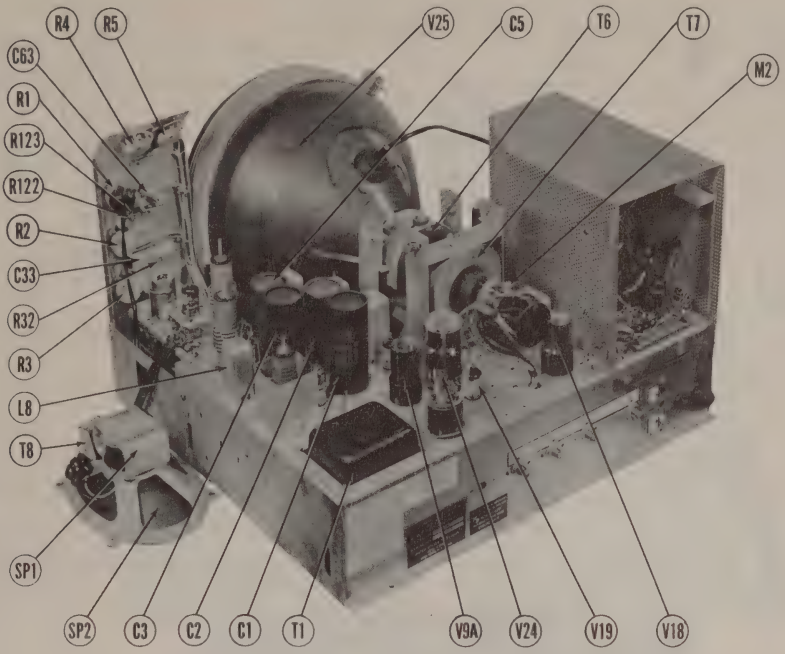
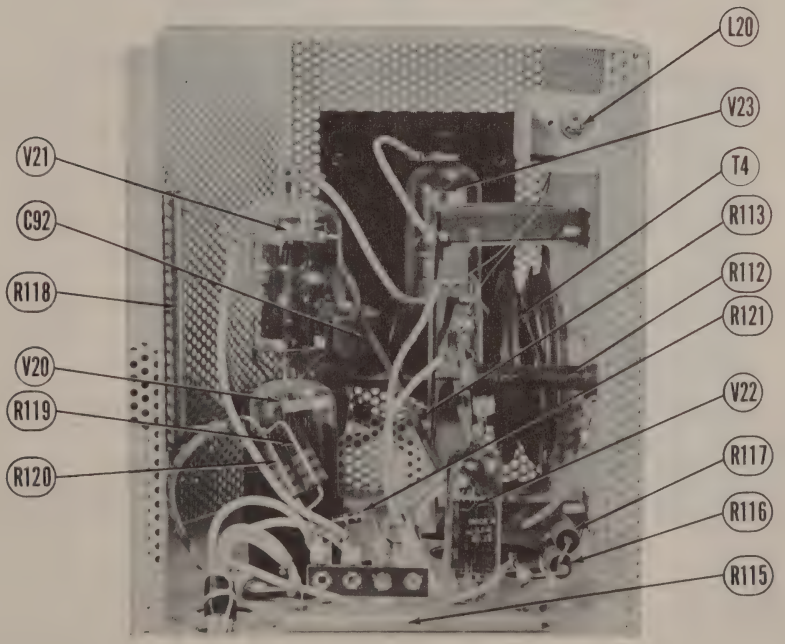


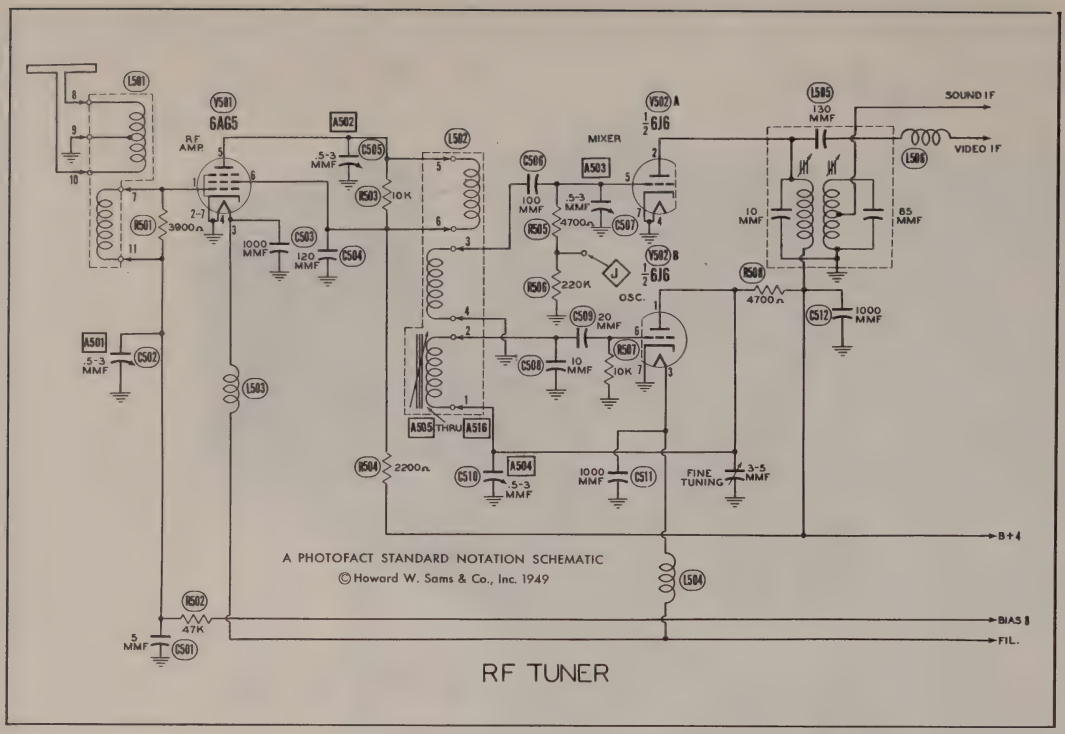
CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS-TOP VIEW



HIGH VOLTAGE SUPPLY



RF TUNER

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	
V501	RF Amp.	6AG5	7BD	
V502	Mixer-Osc.	6J6	7BF	

RESISTORS

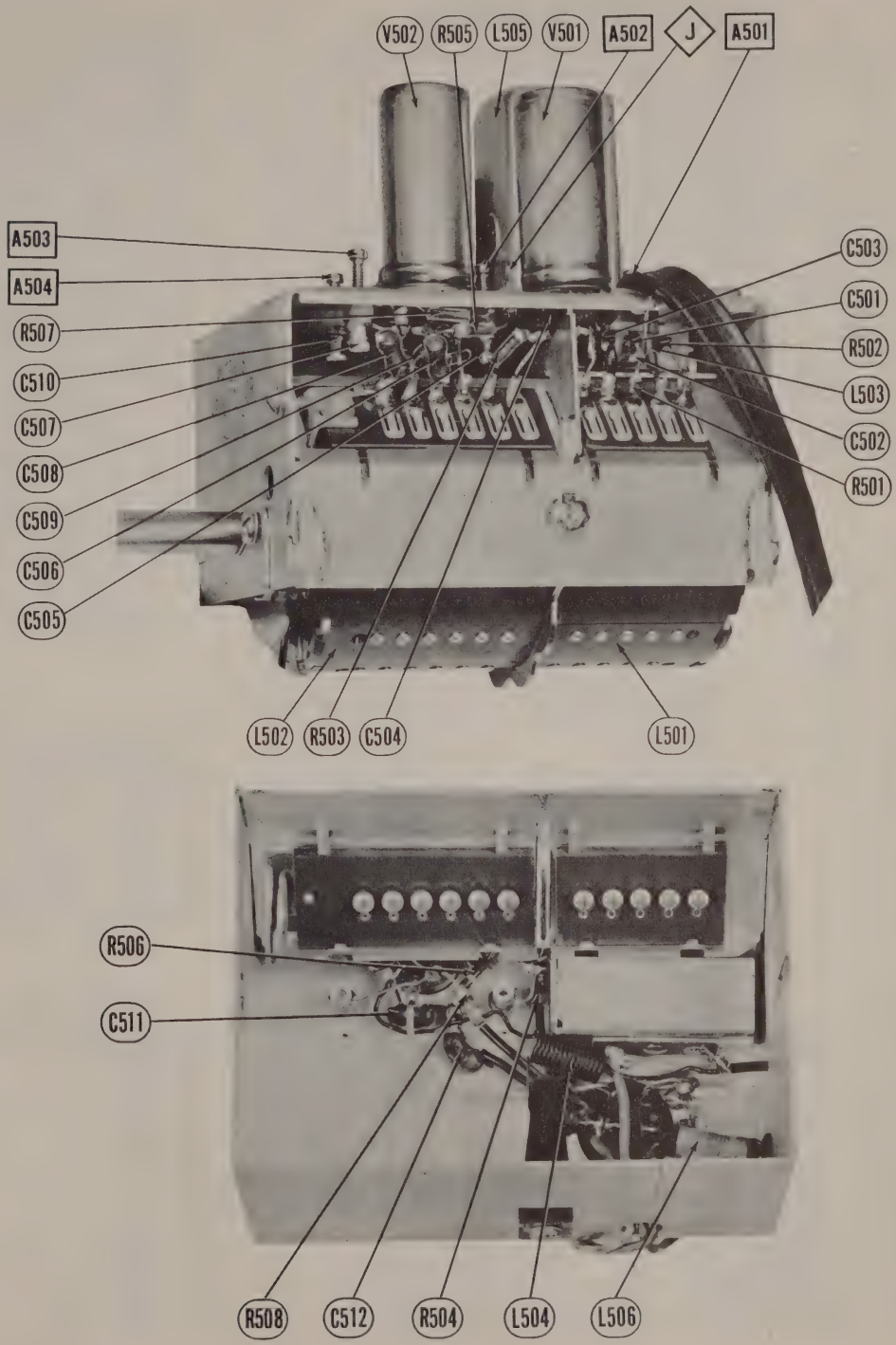
ITEM No.	RATING: RESISTANCE	RATING: WATTS	IDENTIFICATION
R501	3900Ω	½	RF Grid Shunt
R502	47KΩ	½	RF Grid
R503	10KΩ	½	RF Plate Shunt
R504	2200Ω	½	RF Decoupling
R505	4700Ω	½	Mixer Grid
R506	220KΩ	½	Mixer Grid
R507	10KΩ	½	Osc. Grid
R508	4700Ω	½	Osc. Plate

CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT	IDENTIFICATION
C501	5		Fixed Trimmer
C502	.5-3		RF Trimmer
C503	1000		Filament Bypass
C504	120		RF Decoupling
C505	.5-3		RF Trimmer
C506	100		RF Coupling
C507	.5-3		RF Trimmer
C508	10		Osc. Feedback
C509	20		Osc. Grid Cap.
C510	.5-3		Osc. Trimmer
C511	1000		Filament Bypass
C512	1000		RF Bypass

COILS

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	
L501	Ant. Coil	0Ω	0Ω	Replace in matched pairs only. Each coil is identified with channel number.
L502	Mixer & Osc	0Ω	0Ω	
L503	Fil. Choke	0Ω		
L504	Fil. Choke	0Ω		
L505	IF Trans.	0Ω	.2Ω	
L506	RF Coil	.2Ω		


V502
R505
L505
V501
A502
J
A501
A503
A504
R507
C510
C507
C508
C509
C506
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C503
C501
R502
L503
C502
R501
L502
R503
C504
L501
R506
C511
R508
C512
R504
L504
L506

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: UST PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	PA-10-6J6	6J6	7BF	
B	RF Amplifier	PA-10-6J6	6J6	7BF	
C	RF Amplifier	PA-10-6AG5	6AG5	7BD	
V2A	Mixer	PA-10-6J6	6J6	7BF	
B	Mixer	PA-10-6AK5	6AK5	7BD	
C	Converter	PA-10-6J6	6J6	7BF	
V3A	Oscillator	PA-10-6J6	6J6	7BF	
B	Oscillaor	PA-10-6J6	6J6	7BF	
V4	1st Video IF Amp.	PA-10-6AG5	6AG5	7BD	
V5	2nd Video IF Amp.	PA-10-6AG5	6AG5	7BD	
V6	3rd Video IF Amp.	PA-10-6AG5	6AG5	7BD	
V7	4th Video IF Amp.	PA-10-6AG5	6AG5	7BD	
V8	Video Detector	PA-10-6AL5	6AL5	6BT	Some models use a crystal detector.
V9A	Video Amplifier	PA-10-6SN7	6SN7	8BD	Some models use V9A in lieu of V9B and V10.
B	Video Amplifier	PA-10-6AU6	6AU6	7BK	
V10	Video Output	PA-10-6K6	6K6GT	7S	
V11	DC Rest. -Sync Sep. & Phase Invert.	PA-10-6SN7	6SN7GT	8BD	
V12	1st Sound IF Amp.	PA-10-6BA6	6BA6	7BK	
V13	2nd Sound IF Amp.	PA-10-6BA6	6BA6	7BK	
V14	Limiter	PA-10-6AU6	6AU6	7BK	
V15	Discriminator	PA-10-6AL5	6AL5	6BT	
V16	AF Amplifier	PA-10-6AT6	6AT6	7BT	
V17	Audio Output	PA-10-6K6	6K6GT	7S	
V18	Vert. Osc. & Amp.	PA-10-6SN7	6SN7GT	8BD	
V19	Horiz. Phase Det.	PA-10-6AL5	6AL5	6BT	
V20	Horiz. Multivibrator	PA-10-6SN7	6SN7GT	8BD	
V21	Horiz. Output	PA-10-6BG6	6BG6G	5BT	
V22	Damper	PA-10-6X4	6X4	5BS	
V23	HV Rectifier	PA-10-8016	1B3GT	3C	
V24	LV Rectifier	PA-10-5U4	5U4G	5T	
V25	Picture Tube	PA-10-10BP4	10BP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: UST PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	PB-40500-4	AF882K	UP9CJ897		TVL-30	▪ Filter
B	40	450						▲ Filter
C	10	450						▲ Damper Filter
C2A	40	450	PB40500-3	AF822K	UP9CJ731		TVL-53	▲ Filter
B	10	450						▪ Decoupling
C	10	450						▲ Vert Output Decoupling
C3A	80	450	PB40500-11	AF16J	UP9BJ730		TVL-18	▲ Filter
B	50	50		PRS50/50				▲ Vert. Output Cathode Bypass
C4A	10	450	PB40500-1	AF2222J ‡	UP11145 †		EL-300	▪ Filter *
B	24	450						▲ Output Decoupling
C	10	450						▲ Output Cathode Bypass
C5A	30	450	PB40500-2	AF862J4A †	UP9CJ677		TVL-30	▲ Filter
B	30	450						▪ Filter
C	10	450						▲ Filter
C6	10	400		PRS450/10	BR1045		TVA-21	Low Pass Filter *
C7	10			CN10JNPO		NPOK-10		Fixed Trimmer
C8	10			CN10JNPO		NPOK-10		Fixed Trimmer
C9	1500			GP1500M		GP2L-0015		Bias Filter
C10	270			GP270M		GP2K-270		RF Coupling
C11	270			GP270M		GP2K-270		RF Coupling
C12	1.5					NPOK-1.5		Neutralizing
C13	1.5					NPOK-1.5		Neutralizing
C14	.68							RF Coupling
C15	4.7			CN4.7DNPO		NPOK-4.7		RF Coupling
C16	2.2							RF Coupling
C17	1500			GP1500M		GP2L-0015		RF Coupling
C18	22			CN22JNPO				Fixed Trimmer
C19	1500			GP1500M		GP2L-0015		Oscillator Decoupling
C20	10			CN10JNPO		NPOK-10		Fixed Trimmer
C21	4.7			CN4.7DNPO		NPOK-4.7		Oscillator Feedback
C22	4.7			CN4.7DNPO		NPOK-4.7		Oscillator Feedback
C23	1500			GP1500M		GP2L-0015		Filament By pass
C24	1500			GP1500M		GP2L-0015		Mixer Decoupling
C25	68			CN68JNPO		NPOM-68		Fixed Trimmer
C26	270	500	MC-60G-271	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C27	1000		MC-61G-102	GP1000M	1W5D1	GP2L-001	1FM-21	Bias Filter
C28	1000		MC-61G-102	GP1000M	1W5D1	GP2L-001	1FM-21	RF Bypass
C29	1000		MC-61G-102	GP1000M	1W5D1	GP2L-001	1FM-21	1st Video IF Decoupling
C30	43							Fixed Trimmer
C31	270		MC-60G-271	GP270M	5W5T25	GP2K-270	1FM-325	IF Coupling
C32	1000		MC-61G-102	GP1000M	1W5D1	GP2L-001	1FM-21	Bias Filter
C33	.25	400	PC-40GL-254	P488-25	GT4P25		TC-2	Bias Filter
C34	1000		MC-61G-102	GP1000M	1W5D1	GP2L-001	1FM-21	RF Bypass
C35	1000		MC-61G-102	GP1000M	1W5D1	GP2L-001	1FM-21	2nd Video IF Decoupling
C36	270		MC-60G-271	GP270M	5W5T25	GP2K-270	1FM-325	IF Coupling
C37	1000		MC-61G-102	GP1000M	1W5D1	GP2L-001	1FM-21	Bias Filter
C38	1000		MC-61G-102	GP1000M	1W5D1	GP2L-001	1FM-21	RF Bypass
C39	1000		MC-61G-102	GP1000M	1W5D1	GP2L-001	1FM-21	3rd Video IF Decoupling
C40	1000		MC-61G-102	GP1000M	1W5D1	GP2L-001	1FM-21	3rd Video IF Filament Bypass
C41	270		MC-60G-271	GP270M	5W5T25	GP2K-270	1FM-325	IF Coupling
C42	1000		MC-61G-102	GP1000M	1W5D1	GP2L-001	1FM-21	4th Video IF Decoupling
C43	75	500	MC-60G-750	1468-000075	5W5T1	GP1K-75	1FM-475	4th Video IF Cathode Bypass
C44	270		MC-60G-271	GP270M	5W5T25	GP2K-270	1FM-325	IF Coupling
C45	5		MC-60G-050	CN5CNPO	5R5V5	NPOK-5	MS-55	Fixed Trimmer
C46	10	500	MC-60G-100	1468-00001	5W5Q1	GP1K-10	MS-41	Video Detector Filter
C47	.05	400	PC-40GL-503	P488-05			PTE4S5	Video Coupling
C48	.05	600	PC-40GM-503	P688-05			PTE6S5	Video Coupling
C49	.05	600	PC-40GM-503	P688-05			PTE6S5	Video Coupling
C50	.25	400	PC-40GL-254	P488-25			GT4P25	Video Coupling

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: UST PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.
C51	20	500		1468-000025	5W5C
C52	.25	200	PC-40GL-254	P488-25	GT2P
C53	1000		MC-61G-102	GP1000M	1W5D
C54	1000		MC-61G-102	GP1000M	1W5D
C55	.01	600	PC-40GM-103	P688-01	PTE6
C56	1000		MC-61G-102	GP1000M	1W5D
C57	1000		MC-61G-102	GP1000M	1W5D
C58	1000		MC-61G-102	GP1000M	1W5D
C59	36			GP36M	5W5C
C60	1000		MC-61G-102	GP1000M	1W5D
C61	270	500	MC-60G-271	1468-00025	5W5T
C62	.01	400	PC-40GL-103	P488-01	PTE4
C63	.01	400	PC-40GL-103	P488-01	PTE4
C64	.003	600	PC-40GM-302	P688-003	PTE6
C65	.01	600	PC-40GM-103	P688-01	PTE6
C66	.005	600	PC-40GM-502	P688-005	PTE6
C67	.002	600	PC-40GL-202	P688-002	PTE6
C68	.005	400	PC-40GL-502	P688-005	PTE6
C69	.005	400	PC-40GL-502	P688-005	PTE6
C70	4700	500		1467-005	1D5D
C71	.1	400	PC-40GL-104	P488-1	PTE4
C72	.25	400	PC-40GL-254	P488-25	GT4P
C73	.03	600	PC-40GM-303	P688-02	PTE6
C74	.01	400	PC-40GL-103	P488-01	PTE4
C75	1000		MC-61G-102	GP1000M	1W5D
C76	1000		MC-61G-102	GP1000M	1W5D
C77	.005	400	PC-40GL-502	P688-005	PTE6
C78	.05	400	PC-40GL-503	P488-05	PTE4
C79	.05	400	PC-40GL-503	P488-05	PTE4
C80	.01	400	PC-40GL-103	P488-01	PTE4
C81	3900	500			
C82	300	500	MC-60G-301	1468-0003	5W5T
C83	390	500	MC-60G-391	1468-0004	5W5T
C84	270	500	MC-60G-271	1468-00025	5W5T
C85	18	1500			
C86	.05	600	PC-40GM-503	P688-05	PTE6
C87	.25	400	PC-40GL-254	P488-25	GT4P
C88	.03	600	PC-40GM-303	P688-03	PTE6
C89	.03	600	PC-40GM-303	P688-03	PTE6
C90	100	500	MC-60G-101	1468-0001	5W5T
C91	270	500	MC-60G-271	1468-00025	5W5T
C92	500	10000	PA-4313		
C93	500	10000	PA-4313		
C94A	.05	400	PA-4331	P488-05	PTE4
B	.05	400		P488-05	PTE4

* Not used in all models.
† Omit bypass section.
‡ Parallel sections to obtain desired capacity.

CO

ITEM No.	RATING: RESIST-ANCE	RATING: WATTS	REPLACEMENT DATA: U. S. T. PART No.	REPLACEMENT DATA: IRC PART No.	CL PA
R1A	1 Meg.	1/2	PL-8-8	Q13-137	M-6
B	Switch		Not Req.	76-1	SW-
R2	50KΩ	1/2	PL-8-7	Q11-123	M-4
R3	10KΩ	1/2	PL-8-6	Q14-116	M-3
R4	1 Meg.	1/2	PL-8-4	Q11-137	M-6
R5	50KΩ	1/2	PL-8-2	Q13-123	M-4
R6	30Ω	3	PL-8-9		58-2
R7	2200Ω	4	PL-8-1		10-2
R8	5000Ω	1/2	PL-8-3	Q11-114	M-1
R9	2.5Meg.	1/2	PL-8-5	Q11-239	M-8
R10	30Ω	3	PL-8-10		

Note 1. Not used in all models.

RE

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: U. S. T. PART No.	REPLACEMENT DATA: IRC PART No.
R11	150Ω 10%	1/2		
R12	150Ω 10%	1/2		
R13	1000Ω	1/2		BTS-1000
R14	4700Ω	1/2		
R15	4700Ω	1/2		
R16	1000Ω	1/2		BTS-1000
R17	1 Meg.	1/2		
R18	10KΩ 10%	1/2		BTS-10K
R19	1000Ω	1/2		BTS-1000
R20	150Ω	1/2		
R21	4700Ω	1/2		
R22	100KΩ	1/2		
R23	100KΩ	1/2		
R24	47Ω	1/2		
R25	10KΩ 10%	1/2		
R26	39Ω 10%	1/2		
R27	1000Ω 10%	1/2		BTS-1000
R28	150Ω 10%	1/2		
R29	1000Ω 10%	1/2		BTS-1000
R30	82KΩ 10%	1/2		BTS-82K
R31	10KΩ 10%	1/2		BTS-10K
R32	1000Ω 10%	1/2		BTS-1000
R33	12KΩ 10%	1/2		BTS-12K
R34	150Ω 10%	1/2		

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: UST PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	PA-10-6J6	6J6	7BF	
B	RF Amplifier	PA-10-6J6	6J6	7BF	
C	RF Amplifier	PA-10-6AG5	6AG5	7BD	
V2A	Mixer	PA-10-6J6	6J6	7BF	
B	Mixer	PA-10-6AK5	6AK5	7BD	
C	Converter	PA-10-6J6	6J6	7BF	
V3A	Oscillator	PA-10-6J6	6J6	7BF	
B	Oscillator	PA-10-6J6	6J6	7BF	
V4	1st Video IF Amp.	PA-10-6AG5	6AG5	7BD	
V5	2nd Video IF Amp.	PA-10-6AG5	6AG5	7BD	
V6	3rd Video IF Amp.	PA-10-6AC-5	6AG5	7BD	
V7	4th Video IF Amp.	PA-10-6AG5	6AG5	7BD	
V8	Video Detector	PA-10-6AL5	6AL5	6BT	Some models use a crystal detector.
V9A	Video Amplifier	PA-10-6SN7	6SN7	8BD	Some models use V9A in lieu of V9B and V10.
B	Video Amplifier	PA-10-6AU6	6AU6	7BK	
V10	Video Output	PA-10-6K6	6K6GT	TS	
V11	DC Rest. Sync	PA-10-6SN7	6SN7GT	8BD	
	Sep. & Phase Invert.				
V12	1st Sound IF Amp.	PA-10-6BA6	6BA6	7BK	
V13	2nd Sound IF Amp.	PA-10-6BA6	6BA6	7BK	
V14	Limiter	PA-10-6AU6	6AU6	7BK	
V15	Discriminator	PA-10-6AL5	6AL5	6BT	
V16	AF Amplifier	PA-10-6AT6	6AT6	7BF	
V17	Audio Output	PA-10-6K6	6K6GT	TS	
V18	Vert. Osc. & Amp.	PA-10-6SN7	6SN7GT	8BD	
V19	Horiz. Phase Det.	PA-10-6AL5	6AL5	6BT	
V20	Horiz. Multivibrator	PA-10-6SN7	6SN7GT	8BD	
V21	Horiz. Output	PA-10-6BG6	6BG6G	5BT	
V22	Damper	PA-10-6X4	6X4	5BS	
V23	HV Rectifier	PA-10-8008	1B3GT	3C	
V24	LV Rectifier	PA-10-5U4	5U4G	5T	
V25	Picture Tube	PA-10-10BP4	10BP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: UST PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	PB-40500-4	AF582K	UP9CJ897		TVL-30	■ Filter
B	40	450						▲ Filter
C	10	450						◆ Damper Filter
C2A	40	450	PB40500-3	AF822K	UP9CJ731		TVL-53	▲ Filter
B	10	450						◆ Decoupling
C	10	450						▲ Vert Output Decoupling
C3A	80	450	PB40500-11	AF16J	UP9BJ730		TVL-18	▲ Filter
B	50	50		RS250 50				◆ Vert. Output Cathode Bypass
C4A	10	450	PB40500-1	AF2222J †	UP11145 †		EL-300	■ Filter *
B	24	450						▲ Output Decoupling
C	10	450						◆ Output Cathode Bypass
C5A	30	450	PB40500-2	AF862J4A †	UP9CJ677		TVL-30	▲ Filter
B	30	450						■ Filter
C	10	450						◆ Filter
C6	10	400		PRS450/10	BR1045		TVA-21	Low Pass Filter *
C7	10			CN10ZNPO		NPOK-10		Fixed Trimmer
C8	10			CN10ZNPO		NPOK-10		Fixed Trimmer
C9	500			GP1500M		GP2L-0015		Bias Filter
C10	270			GP270M		GP2K-270		RF Coupling
C11	270			GP270M		GP2K-270		RF Coupling
C12	4.5					NPOK-4.5		Neutralizing
C13	1.5					NPOK-1.5		Neutralizing
C14	.68							RF Coupling
C15	4.7			CN4.7DNPO		NPOK-4.7		RF Coupling
C16	2.2							RF Coupling
C17	1500			GP1500M		GP2L-0015		RF Coupling
C18	22			CN22JNPO				Fixed Trimmer
C19	1500			GP1500M		GP2L-0015		Oscillator Decoupling
C20	10			CN10ZNPO		NPOK-10		Fixed Trimmer
C21	4.7			CN4.7DNPO		NPOK-4.7		Oscillator Feedback
C22	4.7			CN4.7DNPO		NPOK-4.7		Oscillator Feedback
C23	1500			GP1500M		GP2L-0015		Filament Bypass
C24	1500			GP1500M		GP2L-0015		Mixer Decoupling
C25	68			CN68JNPO		NPOM-68		Fixed Trimmer
C26	270	500	MC-60G-271	1468-00025	5WS7S	GP2K-270	1FM-325	IF Coupling
C27	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	Bias Filter
C28	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	RF Bypass
C29	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	1st Video IF Decoupling
C30	43							Fixed Trimmer
C31	270		MC-60G-271	GP270M	5WS7S	GP2K-270	1FM-325	IF Coupling
C32	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	Bias Filter
C33	25	400	PC-40GL-254	P488-25		GT4P25	TC-3	Bias Filter
C34	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	RF Bypass
C35	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	2nd Video IF Decoupling
C36	270		MC-60G-271	GP270M	5WS7S	GP2K-270	1FM-325	IF Coupling
C37	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	Bias Filter
C38	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	RF Bypass
C39	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	3rd Video IF Decoupling
C40	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	3rd Video IF Filament Bypass
C41	270		MC-60G-271	GP270M	5WS7S	GP2K-270	1FM-325	IF Coupling
C42	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	4th Video IF Decoupling
C43	75	500	MC-60G-750	1468-000075	5WS7I	GP1K-75	1FM-475	4th Video IF Cathode Bypass
C44	270		MC-60G-271	GP270M	5WS7S	GP2K-270	1FM-325	IF Coupling
C45	5		MC-60G-050	CN5CNPO	5RS7S	NPOK-5	MS-55	Fixed Trimmer
C46	10	500	MC-60G-100	1468-00001	5WS4I	GP1K-10	MS-41	Video Detector Filter
C47	.05	400	PC-40GL-503	P488-05		PTE4S5	TM-15	Video Coupling
C48	.05	600	PC-40GM-503	P688-05		PTE6S5	TM-15	Video Coupling
C49	.05	600	PC-40GM-503	P688-05		PTE6S5	TM-15	Video Coupling
C50	.25	400	PC-40GL-254	P488-25		GT4P25	TC-2	Video Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: UST PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C51	20	500		1468-000025	5WS02	NPOK-20	MS-42	DC Restorer Plate Bypass
C52	.25	200	PC-40GL-254	P488-25	GT2P25		TC-3	Picture Tube Cathode Bypass
C53	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	1st Sound IF Cathode Bypass *
C54	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	1st Sound IF Decoupling
C55	.01	600	PC-40GM-103	P688-01		PTE6S1	GP2-335-01	2nd Sound IF Grid Filter
C56	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	2nd Sound IF Cathode Bypass
C57	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	2nd Sound IF Screen Bypass
C58	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	2nd Sound IF Plate Decoupling
C59	36			GP36M	5WS04	GP1K-39	1FM-44	Limiter Grid Filter
C60	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	Limiter Decoupling
C61	270	500	MC-60G-271	1468-00025	5WS7S	GP2K-270	1FM-325	RF Bypass
C62	.01	400	PC-40GL-103	P488-01		PTE4S1	GP2-335-01	Audio Coupling
C63	.01	600	PC-40GL-103	P488-01		PTE4S1	GP2-335-01	Audio Coupling
C64	.003	600	PC-40GM-302	P688-003		PTE6D3	GP2M-003	De - emphasis
C65	.01	600	PC-40GM-103	P688-01		PTE6S1	GP2-335-01	Audio Coupling
C66	.005	600	PC-40GM-502	P688-005		PTE6D5	GP2M-005	Output Plate Bypass
C67	.002	600	PC-40GL-202	P688-002		PTE6D2	GP2M-002	Integrator Network
C68	.005	400	PC-40GL-502	P688-005		PTE6D5	GP2M-005	Integrator Network
C69	.005	400	PC-40GL-502	P688-005		PTE6D5	GP2M-005	Integrator Network
C70	4700	500		1467-005		HD5D5	GP2M-005	Vertical Oscillator Grid Cap.
C71	.1	400	PC-40GL-104	P488-1		PTE4P1		Vertical Discharge
C72	.25	400	PC-40GL-254	P488-25		GT4P25		Vertical Sweep Coupling
C73	.02	600	PC-40GM-303	P688-02		PTE6S3		Isolation
C74	.01	400	PC-40GL-103	P488-01		PTE4S1	GP2-335-01	Sync Coupling
C75	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	Horiz. Sync Coupling
C76	1000		MC-61G-102	GP1000M	1WS01	GP2L-001	1FM-21	Horiz. Sync Coupling
C77	.005	400	PC-40GL-502	P488-005		PTE6D5	GP2M-005	AFC Filter
C78	.05	400	PC-40GL-503	P488-05		PTE4S5		AFC Filter
C79	.05	400	PC-40GL-503	P488-05		PTE4S5		Horiz. Feedback
C80	.01	400	PC-40GL-103	P488-01		PTE4S1	GP2-335-01	AFC Filter
C81	3900	500						Fixed Trimmer
C82	300	500	MC-60G-301	1468-0003	5WS7S	GP2K-300	MS-33	Horiz. Multivibrator Feedback
C83	390	500	MC-60G-391	1468-0004	5WS74	GP2K-390	1FM-34	Horiz. Discharge
C84	270	500	MC-60G-271	1468-00025	5WS72S	GP2K-270	1FM-325	Hor. Sweep Coupling
C85	18	1500						Hor. Feedback
C86	.05	600	PC-40GM-503	P688-05		PTE6S5	TM-15	Hor. Output Screen Bypass
C87	.25	400	PC-40GL-254	P488-25		GT4P25	TC-2	Hor. Output Cath. Bypass
C88	.03	600	PC-40GM-303	P688-03		PTE6S3	TM-13	Damper Filter
C89	.03	500	PC-40GM-303	P688-03		PTE6S3	TM-13	Damper Filter
C90	100	500	MC-56G-101	1468-0008	5WS7I	GP1K-100	1FM-31	Fixed Trimmer *
C91	270	500	MC-60G-271	1468-00025	5WS72S	GP2K-270	1FM-325	Hor. Cent. Cont. Bypass
C92	500	10000	PA-4313			410-500		HV Filter
C93	500	10000	PA-4313			410-500		HV Filter *
C94A	.05	400	PA-4331	P488-05	PTE4S5		TM-15	Line Filter
B	.05	400		P488-05	PTE4S5		TM-15	Line Filter

* Not used in all models.
† Omit bypass section.
‡ Parallel sections to obtain desired capacity.

CONTROLS

ITEM No	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: UST PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.		P1-8-8	Q13-137	M-63-Z	Volume control
B	Switch		Not Req	76-1	SW-A	Attach to R1A per Instructions
R2	50KΩ		P1-8-7	Q11-123	M-44-S	Brightness control
R3	10KΩ		P1-8-6	Q14-116	M-30-V	Contrast control
R4	1 Meg.		P1-8-4	Q11-137	M-61-Z	Vert. hold control
R5	50KΩ		P1-8-3	Q13-123	M-46-Z	Horiz. hold control
R6	3.3Ω	3	P1-8-9		58-30	Horiz. centering control, Wire Wound
R7	2200Ω	4	P1-8-1		10-2500	Focus control, Wire Wound
R8	500KΩ		P1-8-5	Q11-114	M-18-S	Vert. linearity control
R9	2.5Meg.		P1-8-5	Q11-239	M-84-S	Height control
R10	3.3Ω	3	P1-8-10			Vert. centering control, tapped at 15Ω See Note 1

Note 1. Not used in all models.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: UST PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 20% UNLESS OTHERWISE STATED.
R11	150Ω 10%				RF Grid
R12	150Ω 10%				RF Grid
R13	10000			BTS-1000	Bias Network
R14	470ΩΩ				RF Plate
R15	470ΩΩ				RF Plate
R16	1000Ω			BTS-1000	RF Plate Decoupling
R17	1 Meg.				Mixer Grid
R18	10KΩ 10%			BTS-10K	Mixer Grid Shunt
R19	100Ω			BTS-1000	Mixer Plate Decoupling
R20	150Ω				Decoupling
R21	470ΩΩ				Osc. Plate
R22	100KΩ				Osc. Grid
R23	100KΩ				Osc. Grid
R24	47Ω				Osc. Cathode
R25	10KΩ 10%				1st Video IF Grid
R26	39Ω 10%				1st Video IF Cathode
R27	1000Ω 10%			BTS-1000	1st Video IF Decoupling
R28	150Ω 10%				Decoupling
R29	1000Ω 10%			BTS-1000	Bias Network
R30	82KΩ 10%			BTS-82K	Bias Network
R31	10KΩ 10%			BTS-10K	Bias Network
R32	1000Ω 10%			BTS-1000	Voltage Divider
R33	12KΩ 10%			BTS-12K	Voltage Divider
R34	150Ω 10%				Decoupling

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: UST PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R35	1000Ω 10%			BTS-1000	Bias Network
R36	10KΩ 10%				2nd Video IF Grid
R37	39Ω 10%				2nd Video IF Cathode
R38	1000Ω 10%			BTS-1000	2nd Video IF Decoupling
R39	150Ω 10%				Decoupling
R40	4700Ω 10%				3rd Video IF Grid
R41	39Ω 10%				3rd Video IF Cathode
R42	2700Ω 10%			BTS-2700	3rd Video IF Plate
R43	1000Ω 10%			BTS-1000	3rd Video IF Decoupling
R44	50Ω 10%				4th Video IF Cathode
R45	5600Ω 10%			BTS-5600	4th Video IF Plate
R46	1000Ω 10%			BTS-1000	4th Video IF Decoupling
R47	4700Ω 10%			BTS-4700	Video Det. Load
R48	1 Meg.			BTS-1 Meg.	Video Amp. Grid
R49	3000Ω 5%				Video Amp. Plate
R50	330Ω			BTS-3300	Video Amp. Plate See Note 2
R51	1 Meg.			BTS-1 Meg.	Video Amp. Grid
R52	100Ω 10%			BW-j-100	Video Amp. Cathode
R53	3300Ω 5%			BTA-3300-5%	Video Amp. Plate
R54	6800Ω			BTA-6800	Low Pass Filter See Note 3
R55	820KΩ			BTS-820K	Video Output Grid See Note 2
R56	1.2 Meg.			BTS-1.2 Meg.	Bias Network See Note 2
R57	33Ω			BW-j-330	Video Output Cathode See Note 2
R58	820KΩ			BTS-820K	Voltage Divider
R59	47KΩ			BTS-47K	DC Rest. Load
R60	150KΩ			BTS-150K	DC Rest. Load
R61	1 Meg.			BTS-1 Meg.	Picture Tube Grid
R62	3900Ω			BTS-3900	Sync. Phase Inv. Cathode
R63	1 Meg.			BTS-1 Meg.	Sync. Phase Inv. Grid
R64	3900Ω			BTS-3900	Sync. Phase Inv. Plate
R65	3900Ω 10%			BTS-3900	Sync. Phase Inv. Plate
R66	100Ω				1st Sound IF Cathode
R67	1000Ω			BTS-1000	1st Sound IF Decoupling
R68	470KΩ			BTS-470K	2nd Sound IF Grid
R69	10Ω				2nd Sound IF Cathode
R70	22KΩ			BTS-22K	2nd Sound IF Transformer Shunt
R71	1000Ω			BTS-1000	2nd Sound IF Plate Decoupling
R72	3300Ω			BTS-3300	2nd Sound IF Screen
R73	22KΩ			BTS-22K	Limiter Grid
R74	10KΩ 10%				Limiter Decoupling
R75	10KΩ 10%			BTS-10K	Voltage Divider
R76	100KΩ			BTS-100K	Disc. Diode Load
R77	100KΩ			BTS-100K	Disc. Diode Load
R78	22KΩ			BTS-22K	De-emphasis
R79	15 Meg.			BTS-15 Meg.	AF Grid
R80	220KΩ 10%	1		BTA-220K	AF Plate
R81	470KΩ	1		BTS-470K	Output Grid
R82	47Ω	2		BT-2-470	Output Cathode
R83	1000Ω	2		BW-2-1000	Filter
R84	22KΩ			BTS-22K	Integrator
R85	8200Ω 10%			BTS-8200	Integrator
R86	8200Ω 10%			BTS-8200	Integrator
R87	1 Meg.			BTS-1 Meg.	Vert. Osc. Grid
R88	4.7 Meg.			BTS-4.7 Meg.	Voltage Divider
R89	100KΩ			BTS-100K	Voltage Divider
R90	750KΩ 5%				Vert. Osc. Plate
R91	750KΩ 5%				Vert. Osc. Plate
R92	56KΩ			BTS-56K	Filter
R93	560Ω 10%			BTA-560	Vert. Amp. Cathode
R94	2.2 Meg.			BTS-2.2 Meg.	Vert. Amp. Grid
R95	330KΩ			BTS-330K	Vert. Peaking
R96	1000Ω 10%	1		BTA-1000	Vert. Amp. Decoupling
R97	100KΩ			BTS-100K	Horiz. Phase Det. Load
R98	100KΩ			BTS-100K	Horiz. Phase Det. Load
R99	4.7 Meg.			BTS-4.7 Meg.	Horiz. Phase Det. Load
R100	27KΩ 10%			BTS-27K	Feedback Network
R101	470KΩ			BTS-470K	Horiz. AFC Filter Network
R102	5600Ω 10%			BTS-5600	Horiz. Osc. Plate
R103	2000Ω 5%				Horiz. Osc. Cathode See Note 3
R104	82KΩ			BTS-82K	Horiz. Osc. Grid
R105	270KΩ 10%	1		BTA-270K	Horiz. Osc. Plate
R106	18KΩ	1		BTA-18K	Filter See Note 2
R107	43Ω 10%				Parasitic Supp.
R108	1 Meg.			BTS-1 Meg.	Horiz. Output Grid
R109	82Ω 10%	2		BW-2-82	Horiz. Output Cathode
R110	4700Ω	2		BW-3-4700	Horiz. Output Screen
R111	4700Ω 10%	1		BTS-4700	Feedback
R112	6000Ω 10%	10		AB-6000	Damper Filter Wire Wound
R113	1 Meg. 10%	1			HV Filter
R114	33Ω	2		BW-2-330	Focus Coil Shunt See Note 4
R115	1000Ω 10%	11		DG-1000	Filter Wire Wound
R116	33KΩ	2		BT-2-33K	Bleeder
R117	33KΩ	2		BT-2-33K	Bleeder
R118	8000 10%	11		DG-800	Bias Network Wire Wound
R119	220Ω	2		BW-2-220	Bias Network
R120	220Ω	2		BW-2-220	Bias Network
R121	36Ω 10%				Bias Network See Note 5
R122	47KΩ			BTS-47K	Voltage Divider
R123	4700Ω			BTS-4700	Voltage Divider
R124	5.8 Meg.			BTS-5.8 Meg.	Voltage Divider

Note 2. Not used in all models.
Note 3. Some models use 1800Ω, resistor in this application.
Note 4. Some models use 120Ω, 2 watt resistor in this application.
Note 5. Some models use 18Ω resistor in this application.

U. S. TELEVISION
MODEL T-10823

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	U. S. T. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC at 2.6A	830VCT .310ADC	5VAC at 3A	6.3VAC 8.5A SEC. 4 6.3VAC at .6A	PL-65047			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	DC RESISTANCE		U. S. T. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.					
T2	53Ω						Hor. Osc. Control Coil
T3	172Ω	1540Ω	AB-42346-1	A-8121	A-4000	TBO-1	Vert. Block Osc. Trans.
T4	405Ω	SEC. 1	AC-65043	A-8117		TFB-1	Hor. Output Trans.
	Tap at 175Ω	10.6Ω Tap at .8Ω					
		SEC. 2					
		0Ω					
T5	575Ω	6.9Ω	AB-45014-1	A-8115	A-3035	TSO-1	Vert. Output Trans.
T6A	14Ω		A-44301	DY-1			Hor. Deflection Coil
B	63Ω						Vert. Deflection Coil
T7	250Ω		PB-44802	FC-10			Focus Coil

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		U. S. T. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T8	6.4KΩ	3.8Ω	670Ω	.5Ω	Part of PC-63000-10	A-8114	A-2931	RO-13	

SPEAKER

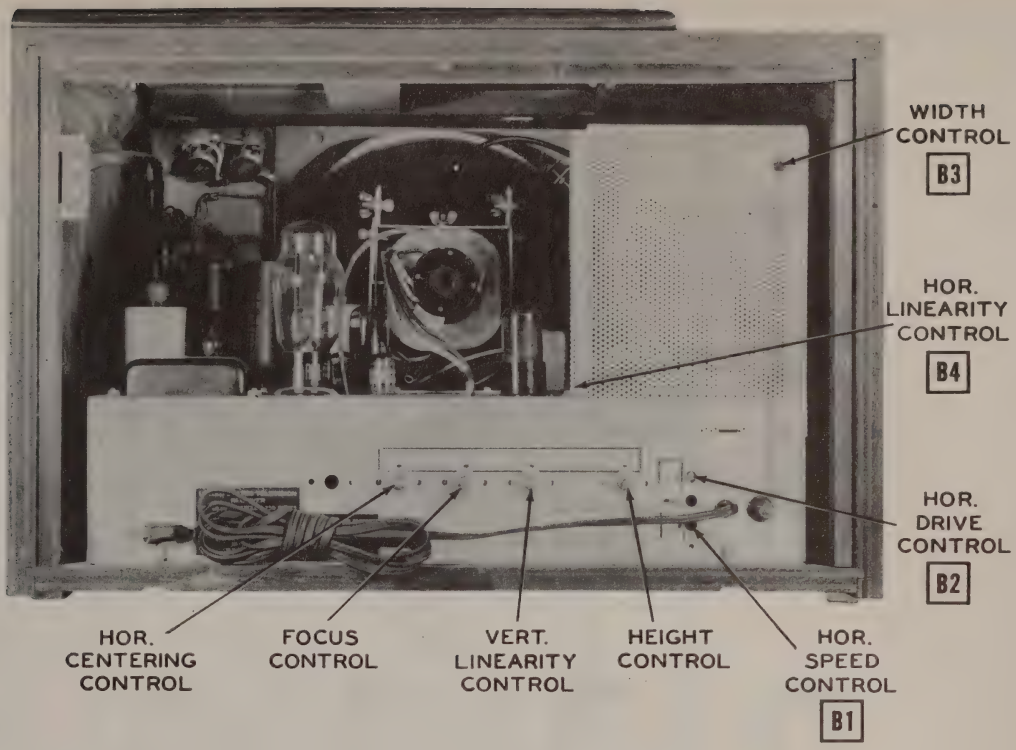
ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	U. S. T. PART No.	JENSEN PART No.	QUAM PART No.	
SP1	65Ω	3.8Ω	PC-63000-10		57E †	† Supplied on order. Give field resistance and current.
	CONE DIA.	V. C. DIA.				
SP2	4 3/4" x 7"	3/4"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	U. S. T. PART No.	MEISSNER PART No.	
L1	Ant. Input	0Ω				Part of tuner.
L2	Interference Trap	0Ω				Part of tuner.
L3	Interference Trap	0Ω				Part of tuner.
L4	Fil. Choke	0Ω				Part of tuner.
L5	Mixer Grid Trap	0Ω				Part of tuner.
L6	1st Video IF & Sound Trap	.2Ω	0Ω			Part of tuner.
L7	2nd Video IF	.1Ω		AB-42342		
L8	3rd Video IF	.1Ω		AB-42343		
L9	4th Video IF	.1Ω		AB-42344		
L10	Sound Trap	0Ω				
L11	5th Video IF	.1Ω		AB-42344		
L12	Peaking	6.5Ω		AB-42277-6		180 microhenries. Wound on 39KΩ resistor.
L13	Peaking	7.5Ω				
L14	Peaking	7.5Ω				
L15	Peaking	5Ω				
L16	Peaking	4.5Ω				
L17	1st Sound IF	.1Ω	.1Ω	AB-42340		
L18	2nd Sound IF	.1Ω	.1Ω	AB-42340		
L19	Disc. Trans.	.1Ω	0Ω	AB-42341		
L20	Width Cont.	.2Ω				
L21	Hor. Linearity	36Ω				
L22	Fil. Choke	0Ω				
L23	Fil. Choke	0Ω				

MISCELLANEOUS

ITEM No.	PART NAME	U. S. T. PART No.	NOTES
M1A	RF Tuner	PA-4409	
B	RF Tuner	PA-4224	
M2	Ion Trap		
M3	Crystal	PA-10-1N34	Video Det.
M4	Fuse	PA-8004	5A. 250V
M5	Switch		Interlock
	Trimmer		Hor. Drive (25-280MMF)



CABINET-REAR VIEW

HORIZONTAL FREQUENCY AND LINEARITY ADJUSTMENTS

Turn the set on an tune in a TV station, preferably a test pattern.

Adjust the fine tuning control for best sound, and set the vertical hold control to synchronize the picture vertically.

Set the horizontal hold control to the mid-position of its range.

Adjust the horizontal speed adjustment (B1) until the picture synchronizes horizontally.

Turn the horizontal drive trimmer (B2) clockwise as far as possible without crowding the left side of the picture.

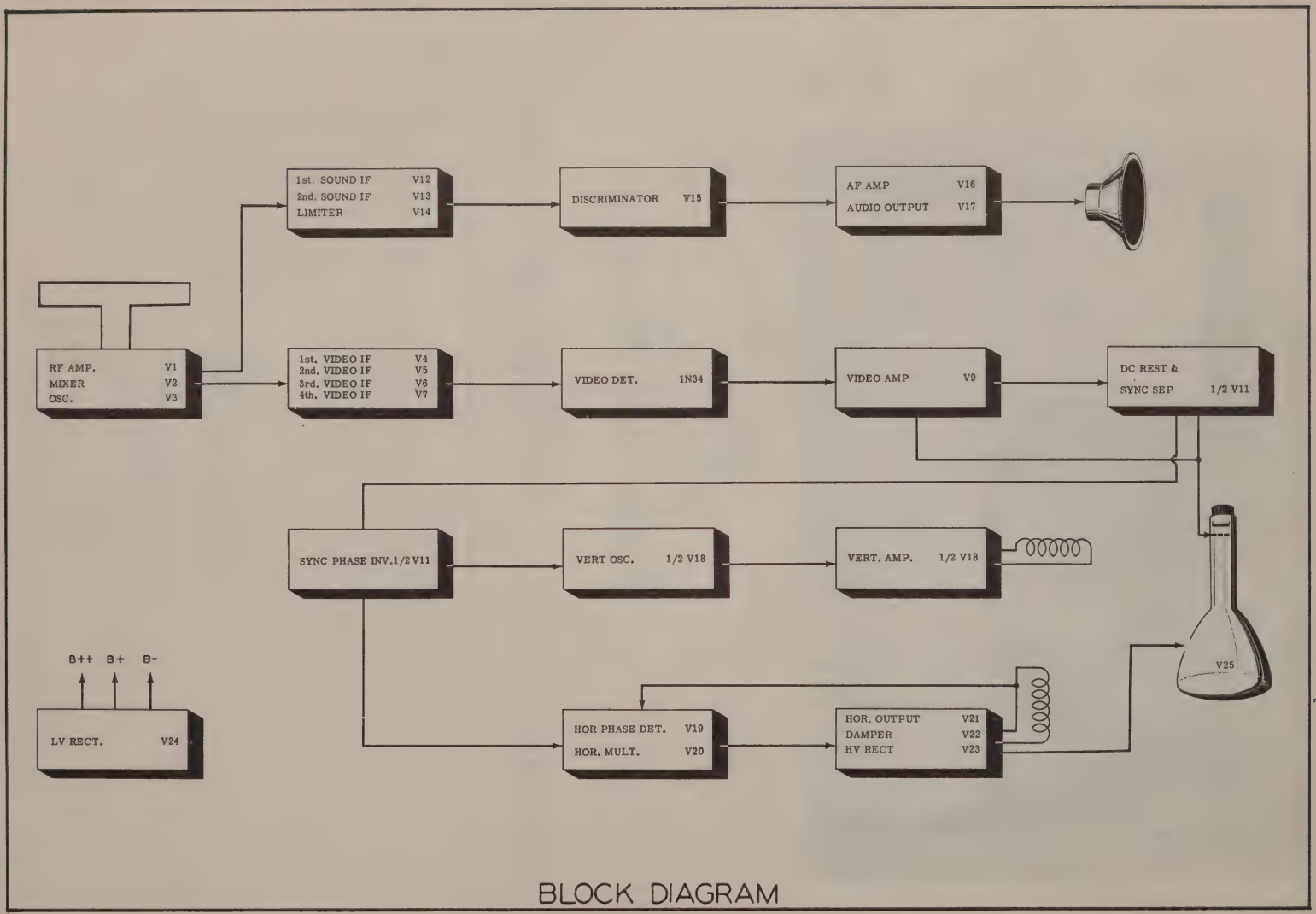
Adjust the width slug (B3) until the picture fills the mask horizontally.

Adjust the horizontal linearity slug (B4) until picture is symmetrical from left to right.

Adjustments B2, B3 and B4 are interacting and should be repeated for optimum results.

DISASSEMBLY INSTRUCTIONS

1. Loosen five allen head set screws and remove control knobs.
2. Remove five screws holding rear cover. Remove cover.
3. Remove two screws holding antenna terminal strip.
4. Remove speaker plug.
5. Remove four screws holding TV chassis. Remove chassis.
6. Remove four screws holding speaker. Remove speaker.



BLOCK DIAGRAM

H303P4, H304P4 (Ch. V-2153)

WESTINGHOUSE MODELS
H303P4, H304P4 (Ch. V-2153)

WESTINGHOUSE MODEL H303P4

TRADE NAME	Westinghouse, Models H303P4, H304P4 (Ch. V-2153)
MANUFACTURER	Westinghouse Electric Corp., Receiver Div., Sunbury, Pa.
TYPE SET	Three Power Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES (FOUR)	Types 1R5 Converter, 1U4 IF Amp., 1U5 DET-AVC-AF, 3V4 Power Output
POWER SUPPLY	105-120 Volts AC-DC or 4.5 Volts "A" Supply and 90 Volts "B" Supply
RATING	.16 Amp. at 117 Volts AC or 110MA at 4.5 Volts DC and 11MA at 90 Volts DC
TUNING RANGE—BROADCAST	540-1615KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning gang fully closed and set the right hand edge of the pointer 1/4 inch from the right hand end of the dial backplate.

Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	200MMF	High side to stator on front section of tuning gang. Low side to B-.	455KC (400 ~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output in the order given.
2.	200MMF	"	1615KC	"	"	A5	Adjust for maximum output.
3.		Loop	1400KC	Tune for max. output.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 1, Indiana

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PARTS LIST AND DESCRIPTIONS

WESTINGHOUSE MODEL H303P4

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: WESTINGHOUSE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amp.	1U4	1U4	6AR	
V3	Det.-AVC-AF	1U5	1U5	6BW	
V4	Power output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: WESTINGHOUSE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	90	150	V-9416	E4D229				▲ Filter
B	100	150						■ Filter
C	60	150						▲ Filter
D	200	25						Filament Bypass
C2	05	200	RCP10W2503M	P288-05	PTE4S5		TM-15	AVC Filter
C3	05	200	RCP10W2503M	P288-05	PTE4S5		TM-15	Osc. Anode Decoupling
C4	.15	200	RCP10W2154M	P288-15	GT4P2		68P18	Filament Bypass
C5	.15	200	RCP10W2154M	P288-15	GT4P2		72P52	Line Isolation
C6	002	600	RCP10W6202M	P688-002	PTE6D2	GP2M-002	TM-22	IF Decoupling
C7A	120		*	GP120M	5W5T15	GP2K-120	1FM-315	Diode RF Filter
B	120			GP120M	5W5T15	GP2K-120	1FM-315	Diode RF Filter
C8	.15	200	RCP10W2154M	P288-15	GT4P2		68P18	Filament Bypass
C9	05	200	RCP10W2503M	P288-05	PTE4S5		68P16	Audio Coupling
C10	05	200	V-6066-2503M	P288-05	PTE4S5		68P16	AF Amp. Screen Bypass
C11	002	600	RCP10W4202M	P688-002	PTE6D2	GP2M-002	TM-22	Audio Coupling
C12	002	600	V-6066-4202M	P688-002	PTE6D2	GP2M-002	TM-22	Output Plate Bypass
C13	05	400	V-6066-4503M	P488-05	PTE4S5		68P10	Line Filter

Note 1. Not used with volume control with part No. V-6198-1.

Note 2. Items C7A, C7B and R9 are combined into one unit, obtainable under MFGR'S Part No. V-6232-2.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	2Meg.	½	V-5666-4	Q13-139	M-66-2	Volume Control - See note.
B	Switch		Not req.	76-1	SW-A	Attach to R1A per instructions.

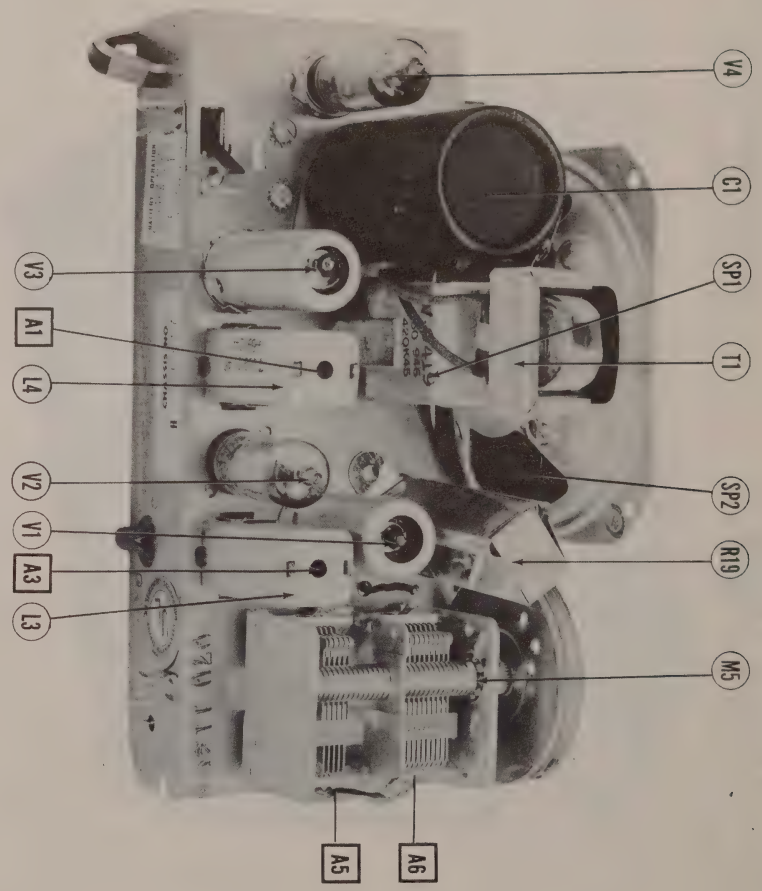
Note. Some models use volume control part No. V-6198-1

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WESTINGHOUSE PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R2	100KΩ	½	RC20AE104M	BTS-100K	Osc. Grid
R3	6800Ω	½	RC20AE682M	BTS-6800	Osc. Anode Decoup.
R4	470KΩ	½	RC20AE474M	BTS-470K	Bias Network
R5	82KΩ	½	RC20AE823K	BTS-82K	Bias Network
R6	3.3 Meg.	½	RC20AE335M	BTS-3.3 Meg.	AVC Network
R7	2200Ω	½	RC20AE222M	BTS-2200	IF Decoup.
R8	680KΩ	½	RC20AE684M	BTS-680K	Volume control shunt See Note 1
R9	47KΩ	½		BTS-47K	Diode Filter See Note 2
R10	10 Meg.	½	RC20AE106M	BTS-10 Meg.	AF Grid
R11	4.7 Meg.	½	RC20AE475M	BTS-4.7Meg.	AF Screen
R12	1 Meg	½	RC20AE105M	BTS-1 Meg.	AF Plate
R13	2.2 Meg.	½	RC20AE225M	BTS-2.2 Meg.	Output Grid
R14	1200Ω	½	RC20AE122K	BTS-1200	Filament String
R15	820Ω	½	RC20AE821K	BTS-820	Filament String
R16	27Ω	½	RC20AE270K	BW-½-27	Filament String
R17	1000Ω	½	RC20AE102M	BTS-1000	Filament String
R18	220KΩ	½	RC20AE224M	BTS-220K	Isolation
R19A	1355Ω	5	V-9125-2		Filter-Wire Wound
B	1355Ω	5			Filament Dropping-Wire Wound
R20	3300Ω	1	RC30AE332K	BW-1-3300	Filter
R21	22Ω	1	RC30AE220M		Surge Limiter

* Items C7A, C7B and R9 are combined into one unit obtainable under MFGR'S Part No. V-6232-2.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	7.5KΩ	3.2Ω	395Ω	.5Ω	Part of V-9419	A-3329	A-2927†	RO-13	† Drill new mounting holes.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			WESTINGHOUSE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	FIELD	V.C. IMP.	V-9419	ST-113 † Mod. P4-X	4A07 †	† Remount output transformer.
	PM	3.2Ω				
	CONE DIA.	V.C. DIA.				
SP2	3 7/8"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	WESTINGHOUSE PART No.	MEISSNER PART No.	
L1	Loop Ant.	4Ω		V-9405		
2	Osc. Coil	2.7Ω	12.5Ω	V-5661	14-1074	
3	Input IF	19Ω	19Ω	V-6972-3	16-6668	
4	Output IF	25Ω	25Ω	V-6972-4	16-6669	

SELENIUM RECTIFIER

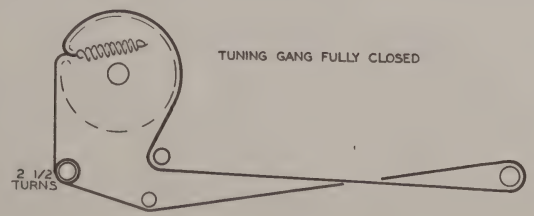
ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	WESTINGHOUSE PART No.	SYLVANIA PART NO.		
M1	.063A	V-9446-1	NB-5		

BATTERIES

ITEM No.	VOLTAGE	Westinghouse PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	4.5V "A"	V-9292	736			F3			
M3	90V "B"	V-9293		490			N60		

MISCELLANEOUS

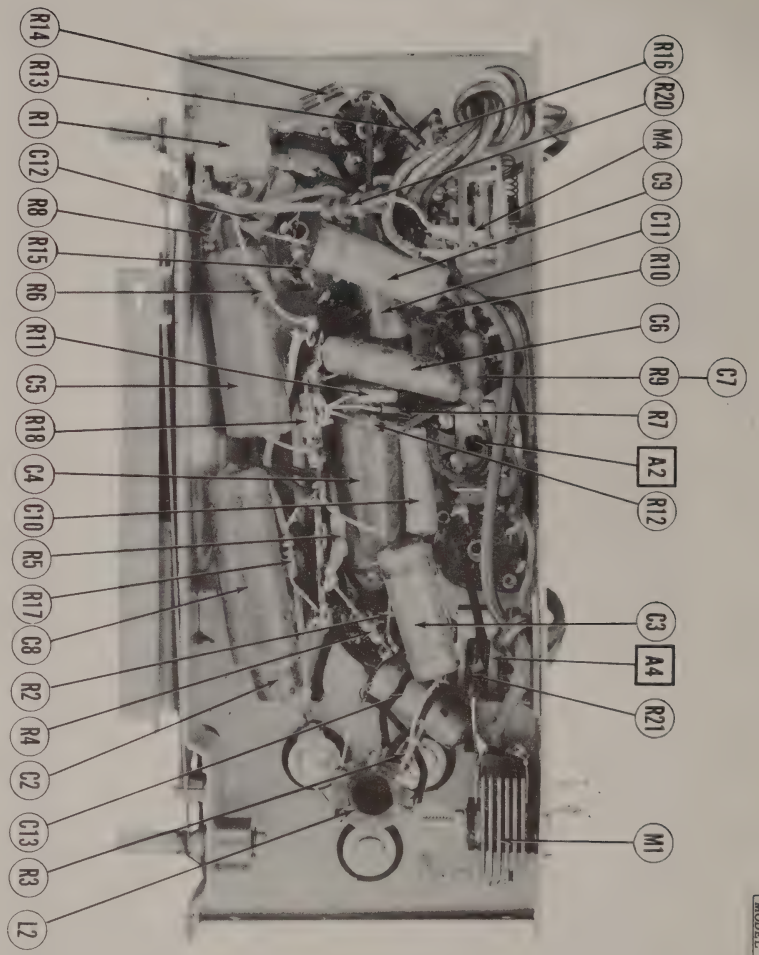
ITEM No.	PART NAME	WESTINGHOUSE PART No.	NOTES
M4	Switch	V-9420	AC/DC - Battery
M5	2 Gang Var. Cap.	V-5651	(24-378MMF, 16-108MMF)
	Knob	V-5698-1	
	Cabinet	V-1157-6	Tan
	Cabinet	V-1157-7	Blonde



DIAL CORD DRIVE

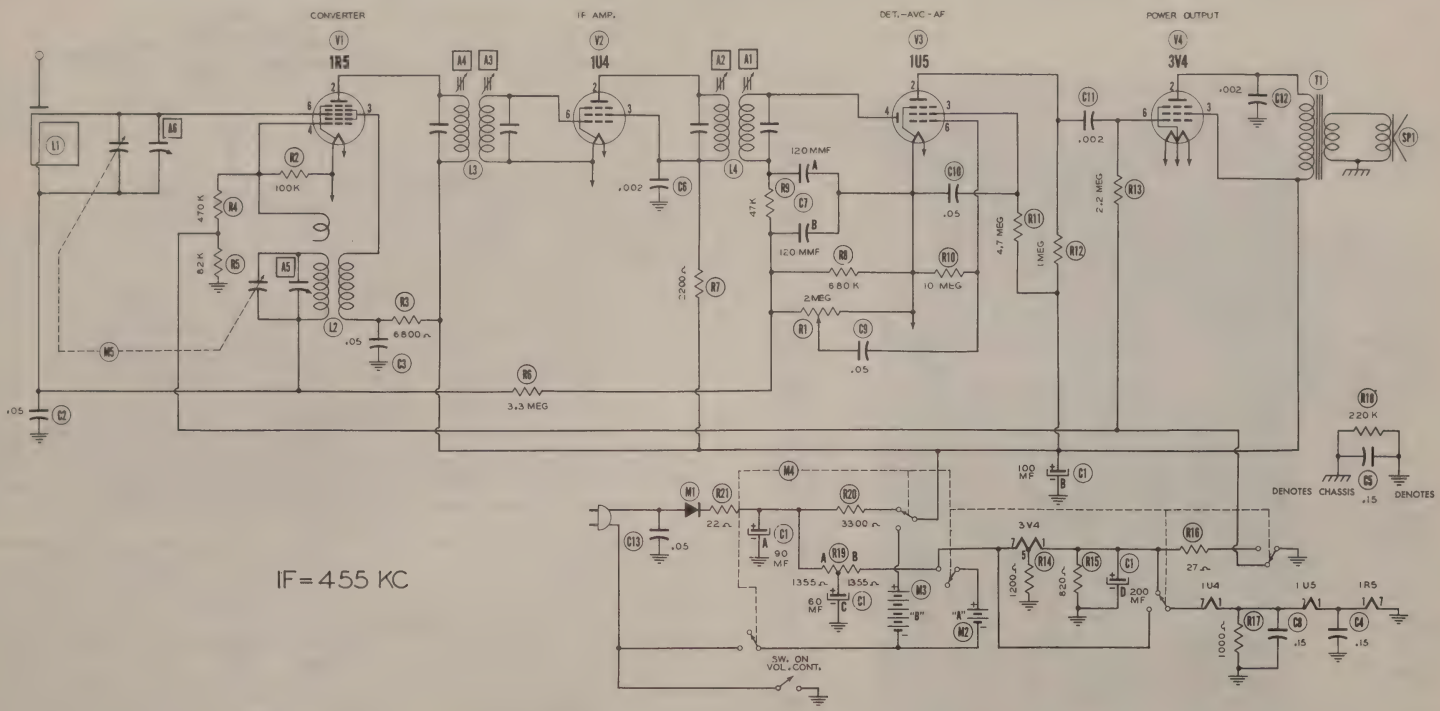
SET 89 FOLDER 16

CHASSIS—BOTTOM VIEW



WESTINGHOUSE MODEL H303P4

WESTINGHOUSE MODEL H303P4



NOTE: VOLTAGE AND RESISTANCE MEASUREMENTS TAKEN IN AC - DC POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	1.3VDC	88VDC	65VDC	§–11VDC	1.3VDC	0V.	0V.
V 2	1U4	2.6VDC	86VDC	86VDC	0V.	2.6VDC	2.6VDC	3.9VDC
V 3	1U5	1.3VDC	20VDC	17VDC	.3VDC	1.3VDC	0V.	2.6VDC
V 4	3V4	3.9VDC	87VDC	88VDC	0V.	5.2VDC	0V.	6.6VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†3.3KΩ	†10KΩ	100KΩ	*	4 Meg.	*
V 2	1U4	*	†5.5KΩ	†5.5KΩ	Inf.	*	*	*
V 3	1U5	*	†1 Meg.	†4.7 Meg.	600KΩ	*	10 Meg.	*
V 4	3V4	*	†4KΩ	†3.3KΩ	Inf.	*	2.2 Meg.	*

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM OUTPUT OF M1.

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

HALLICRAFTERS MODELS
518, 519, 520, 521, 600,
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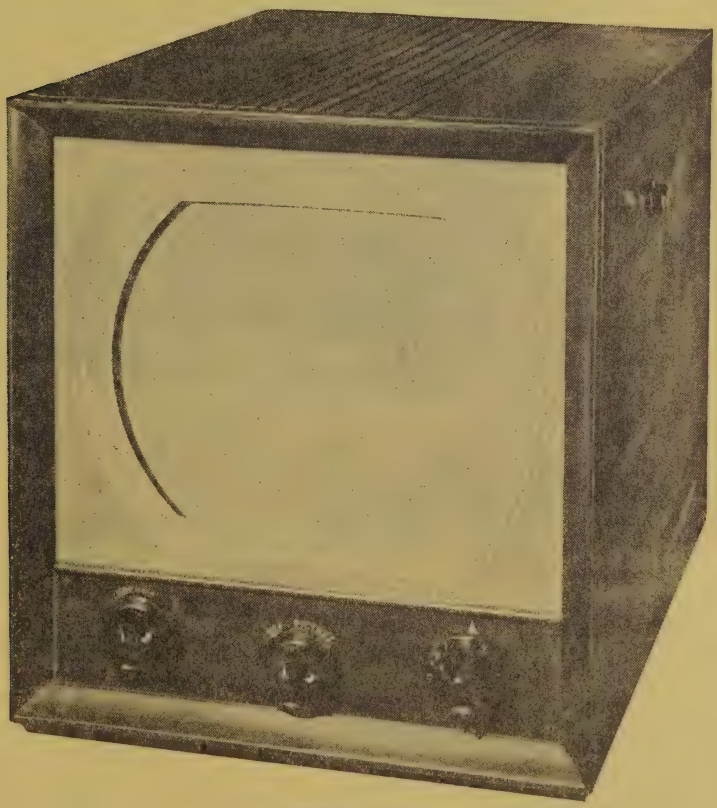

MODEL 600

HALLICRAFTERS MODELS
518, 519, 520, 521, 600,
601, 602, 603, 604

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Date 4/50 Set No. 92—Folder No. 3

HALLICRAFTERS MODELS 518, 519, 520, 521, 600, 601, 602, 603, 604

HALLICRAFTERS MODEL 600

TRADE NAME	Hallicrafters Models 518, 519, 520, 521. 600, 601, 602, 603, 604
MANUFACTURER	The Hallicrafters Co., 4401 W. 5th Ave., Chicago, Illinois
TYPE SET	Television Receiver
TUBES	Twenty

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 1.35 Amp. at 117 Volts AC
TUNING RANGE—Channels 2 thru 13

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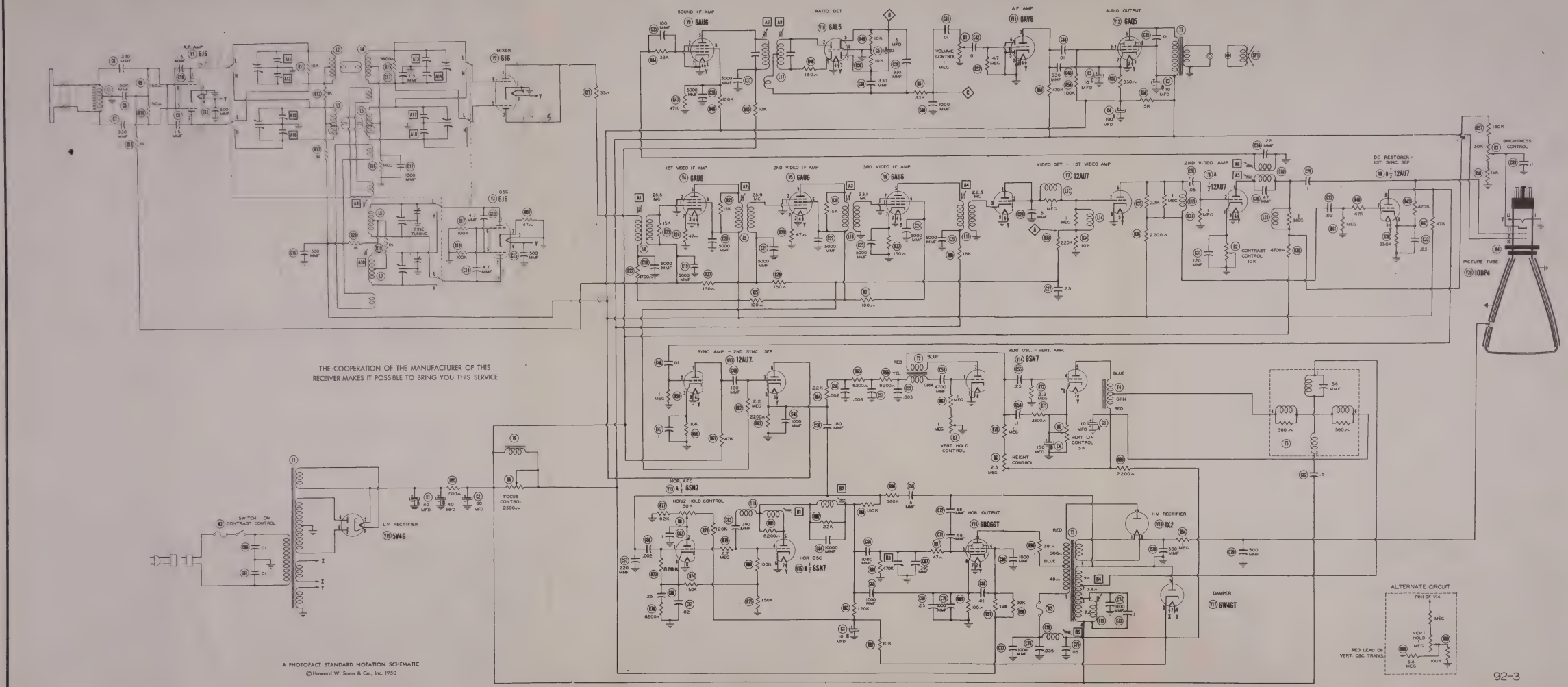

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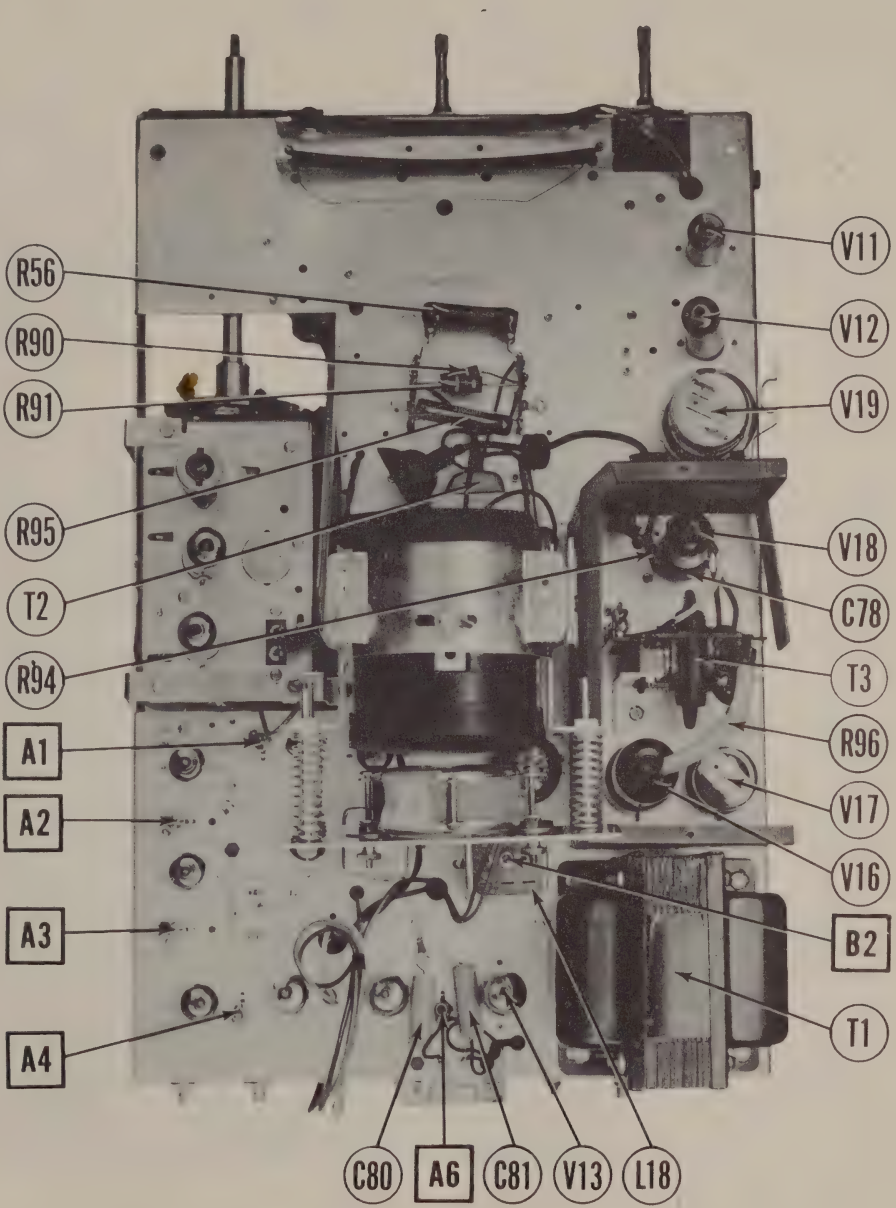
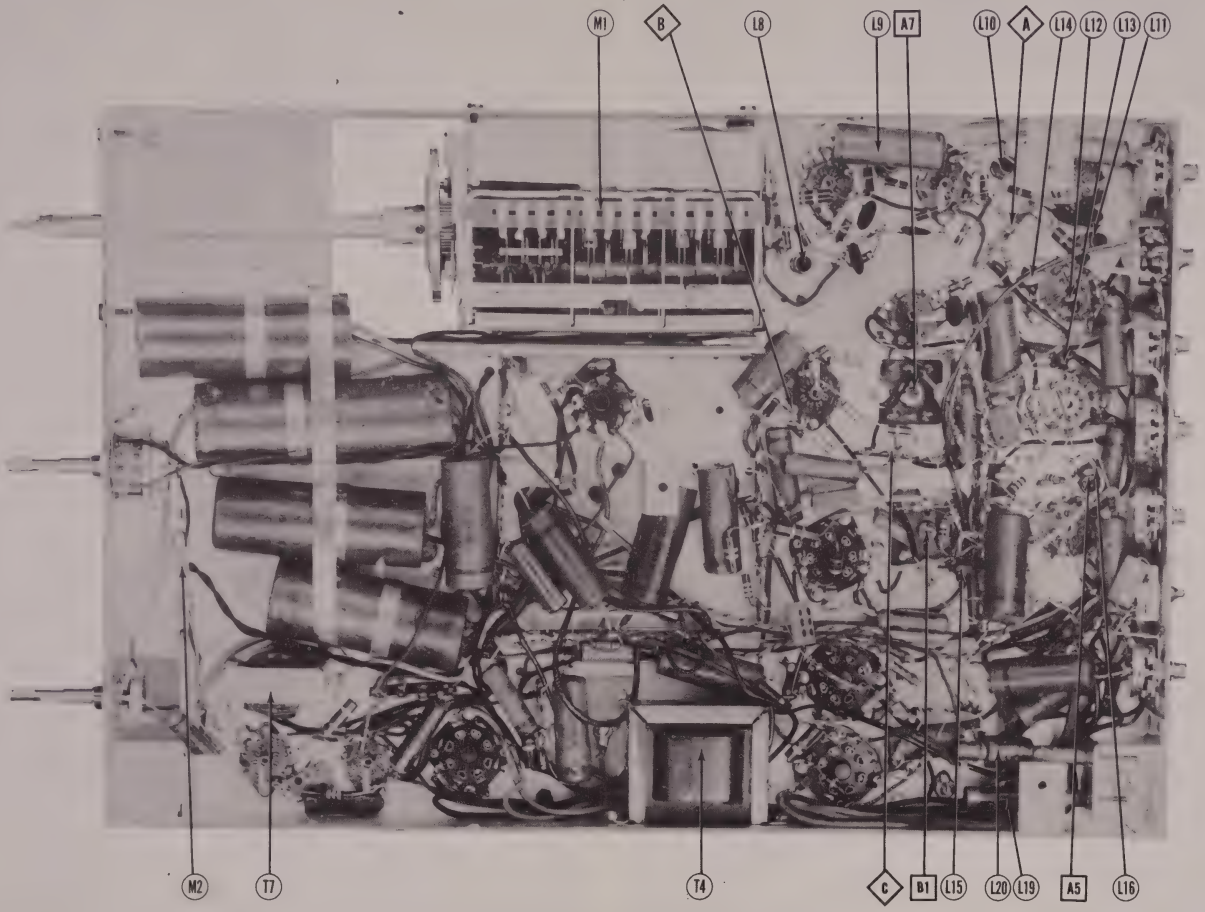
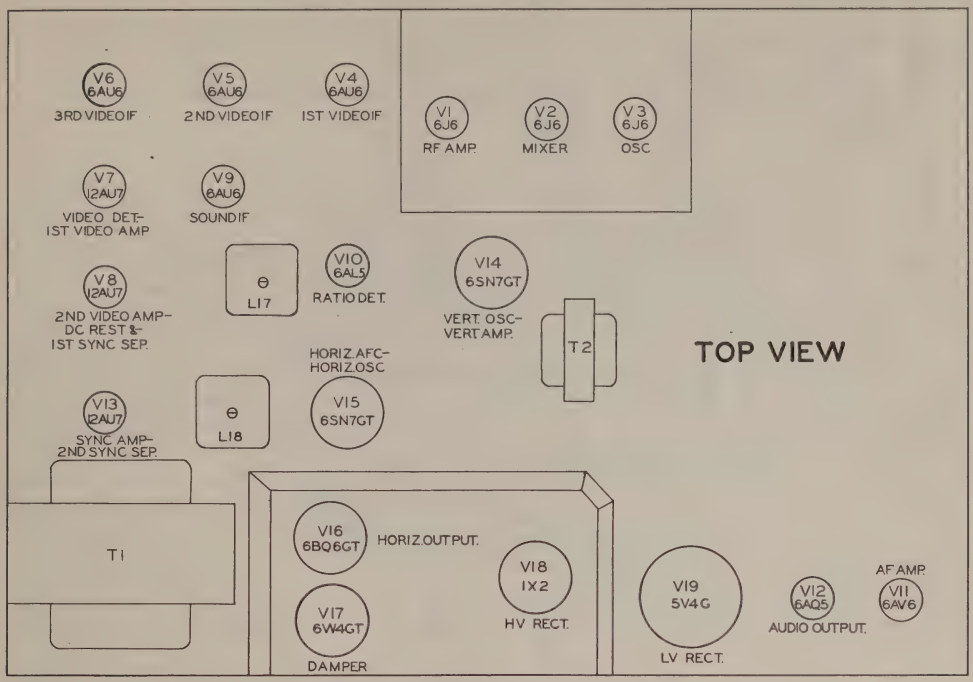
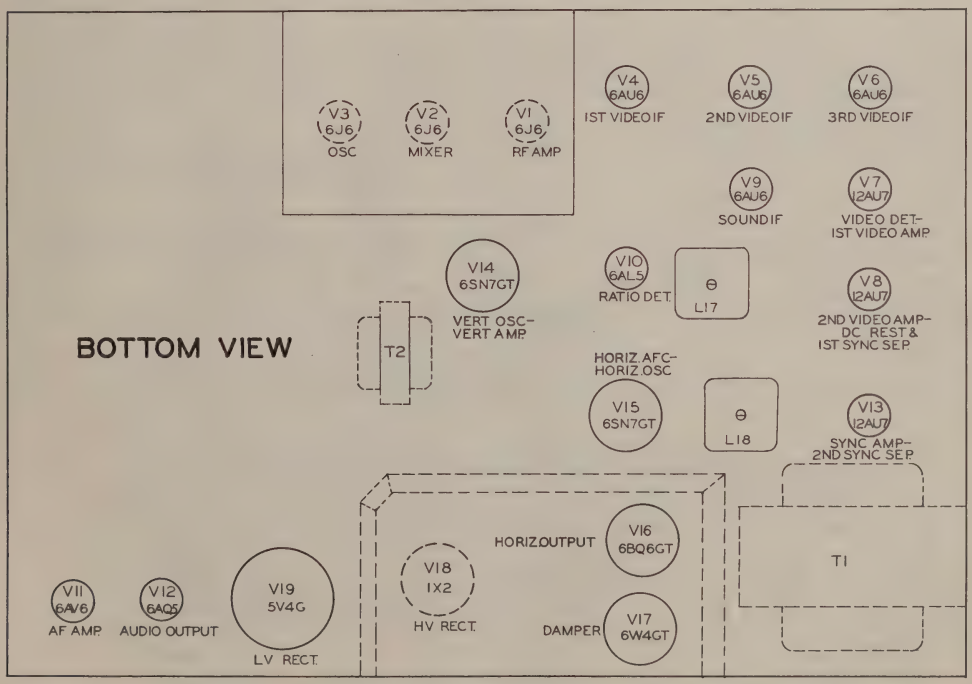


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the high voltage shock hazard and remove the horizontal oscillator tube (V15) from its socket.

VIDEO IF ALIGNMENT

Remove the local oscillator (V3) to prevent erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	25.5MC (Unmod.)	Any	DC Probe to Point (A) Common to chassis.	A1	Adjust for maximum deflection.
2.	Direct	"	29.9MC	"	"	A2	"
3.	Direct	"	23.1MC	"	"	A3	"
4.	Direct	"	22.9MC	"	"	A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	23MC (10MC SWP)	21.75MC 26.25MC	Any	Vert. Amp. to Point (A) Low side to chassis.		Check for response curve similar to Fig 1. If necessary retouch A1 thru A4 for optimum response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to pin 2 (Grid) of 12AU7 (V8). Low side to chassis.	4.5MC (Unmod.)	Any channel not used locally	DC Probe to Point (B) Common to chassis.	A5, A6, A7	Adjust for maximum deflection. Attenuate signal generator to maintain 2 volt reading.
7.	.01MFD	"	"	"	DC Probe to Point (C) Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to pin 2 (Grid) of 12AU7 (V8). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any channel not used locally	Vert. Amp. to Point (B) Low side to chassis.	A5, A6, A7	Disconnect stabilizer capacitor C5. Adjust for maximum amplitude and symmetry as per Fig 2.
7.	.01MFD	"	"	"	"	Vert. Amp. to Point (C) Low side to chassis.	A8	Reconnect capacitor C5. Adjust A8 so 4.5MC occurs at center of crossover lines as per Fig 3. Slightly retouch A7 for maximum amplitude and straightness of crossover lines

OSCILLATOR ALIGNMENT

The local oscillator operates 24.5MC below the center frequency of each channel, therefore is necessary to use a 24.5MC "BFO" generator to obtain a zero beat with the center frequency of the channel. Loosely couple the "BFO" generator to the video detector (V7). There are no oscillator adjustments for the individual channels. The oscillator is adjusted for the low channels on channel 2, and for the high channels on channel 7. Replace tube V3.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	BFO GEN. FREQUENCY	ADJUST	REMARKS
8.	Two 150Ω carbon res.	Across antenna terminals with 150Ω in each lead.	57MC (Unmod.)	2	24.5MC	A9	Connect a .01 capacitor between pin 2 (Grid) of the picture tube and pin 1 (Grid) of the first audio tube (V11). Adjust for rough audio beat note in the speaker.
9.	"	"	177MC	7	"	A10	"

RF ALIGNMENT

The RF and Mixer lines of this receiver are pre-set at the factory and are normally very stable. Alignment should not be attempted unless they are definitely known to be out of alignment.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	Two 150Ω carbon res.	Across antenna terminals with 150Ω in each lead.	85MC (Unmod.)	6	DC Probe to Point (A) Common to chassis.	A11, A12, A13, A14	Adjust for maximum deflection. Keep trimmer pairs at approximately the same relative position.
11.	"	"	213MC (Unmod.)	13	"	A15, A16, A17, A18	"

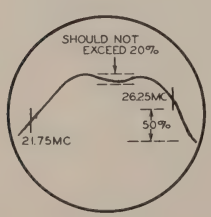


FIG.1

FIG. 2

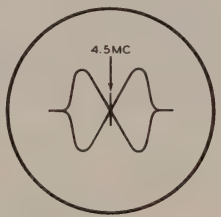
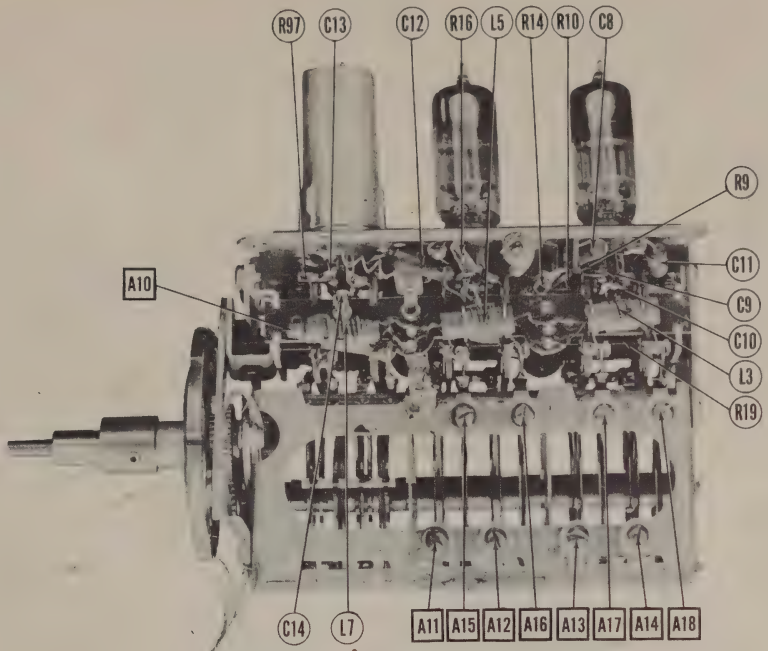
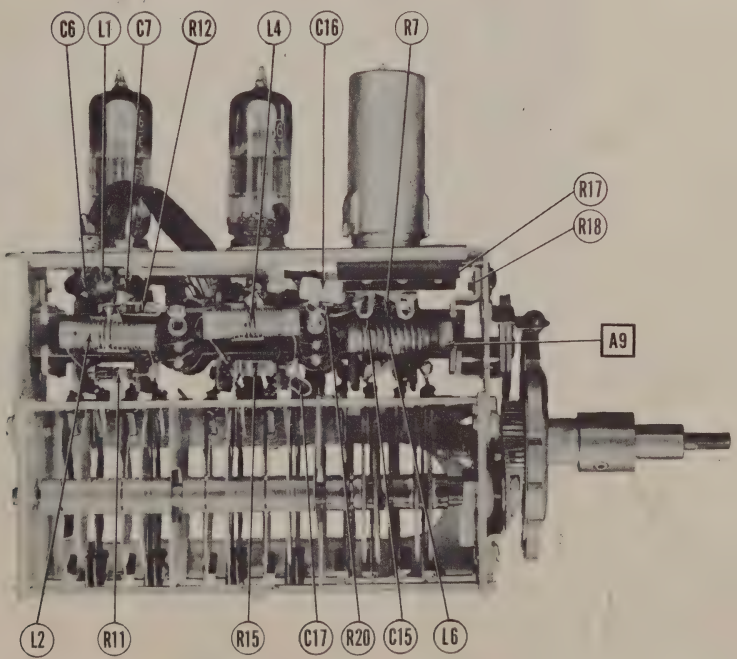


FIG. 3



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	95VDC	95VDC	0V.	6.3VAC	-.2VDC	-.3VDC	0V.		
V 2	6J6	95VDC	95VDC	6.3VAC	0V.	-2.4VDC	-2.6VDC	0V.		
V 3	6J6	100VDC	100VDC	0V.	6.3VAC	§-3.8VDC	§-4.2VDC	0V.		
V 4	6AU6	-2.6VDC	0V.	0V.	6.3VAC	122VDC	122VDC	.4VDC		
V 5	6AU6	-.6VDC	0V.	0V.	6.3VAC	120VDC	120VDC	.4VDC		
V 6	6AU6	0V.	0V.	0V.	6.3VAC	235VDC	125VDC	1.1VDC		
V 7	12AU7	-.4VDC	-.4VDC	0V.	6.3VAC	6.3VAC	100VDC	-.4VDC	0V.	0V.
V 8	12AU7	310VDC	0V.	16VDC	6.3VAC	6.3VAC	120VDC	0V.	8.8VDC	0V.
V 9	6AU6	-.4VDC	0V.	6.3VAC	0V.	300VDC	33VDC	0V.		
V 10	6AL5	0V.	0V.	6.3VAC	0V.	.2VDC	0V.	-.2VDC		
V 11	6AV6	-.4VDC	0V.	0V.	6.3VAC	0V.	0V:	85VDC		
V 12	6AQ5	♦0V.	♦10VDC	0V.	6.3VAC	200VDC	210VDC	♦0V.		
V 13	12AU7	260VDC	0V.	12VDC	6.3VAC	6.3VAC	122VDC	0V.	4.5VDC	0V.
V 14	6SN7GT	-4.3VDC -4.7VDC	50VDC 155VDC	0V.	0V.	400VDC	0V. 20VDC	6.3VAC	0V.	
V 15	6SN7GT	-30VDC	120VDC 205VDC	-20VDC	-55VDC	175VDC	0V.	6.3VAC	0V.	
V 16	6BQ6GT	0V.	6.3VAC	410VDC	120VDC	-10VDC	320VDC	0V.	7.6VDC	TOP CAP *
V 17	6W4GT	380VDC	420VDC	420VDC	0V.	320VDC	200VDC	¶	¶	
V 18	1X2	* DO NOT MEASURE.								
V 19	5V4G	0V.	360VDC	0V.	325VAC	0V.	325VAC	0V.	360VDC	
V 20	10BP4	0V.	2.5VDC	PIN 10 120VDC	PIN 11 18VDC 80VDC	PIN 12 6.3VAC				

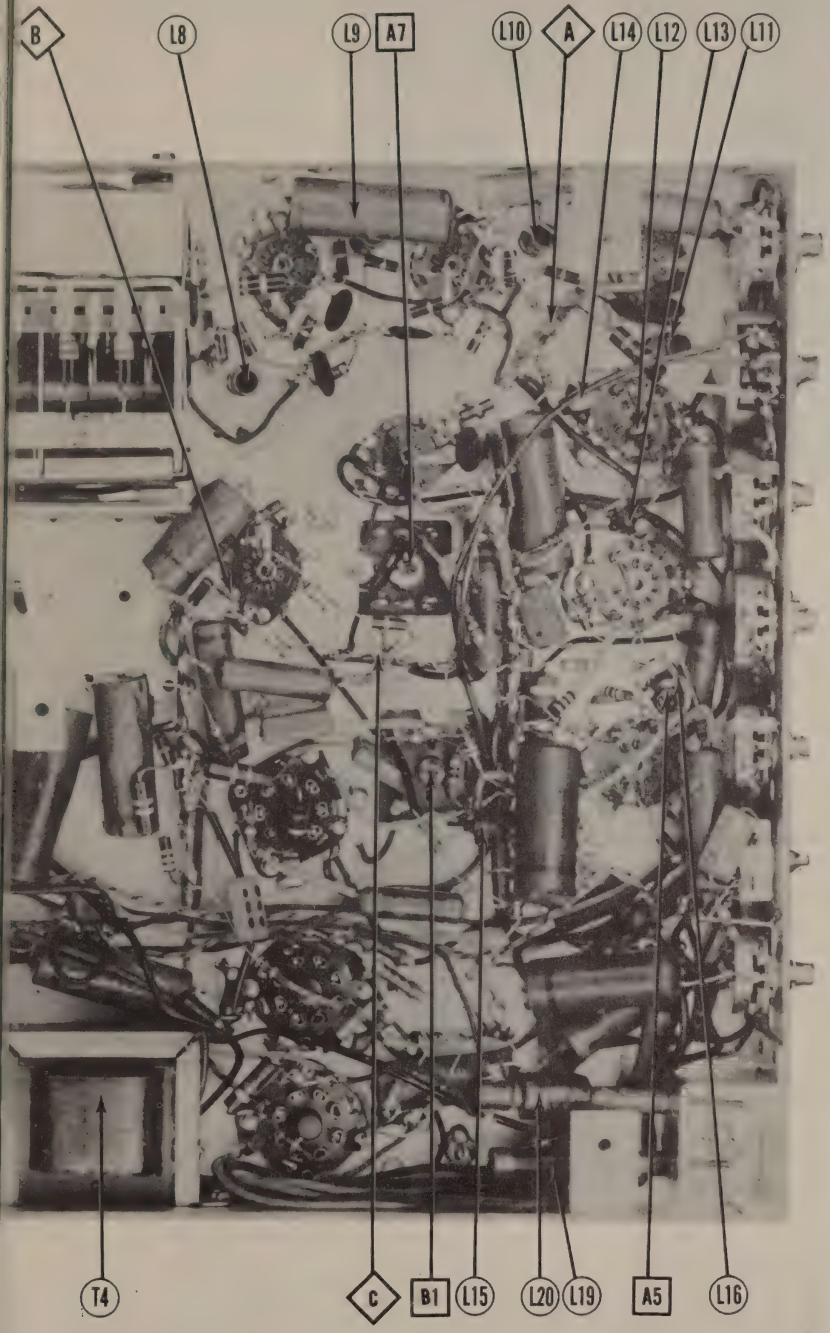
§ TAKEN WITH VACUUM TUBE VOLTMERTER.
* DO NOT MEASURE.
♦ MEASURED FROM PIN 6 OF V4.
¶ 6.3VAC MEASURED ACROSS FILAMENTS.

RESISTANCE READINGS

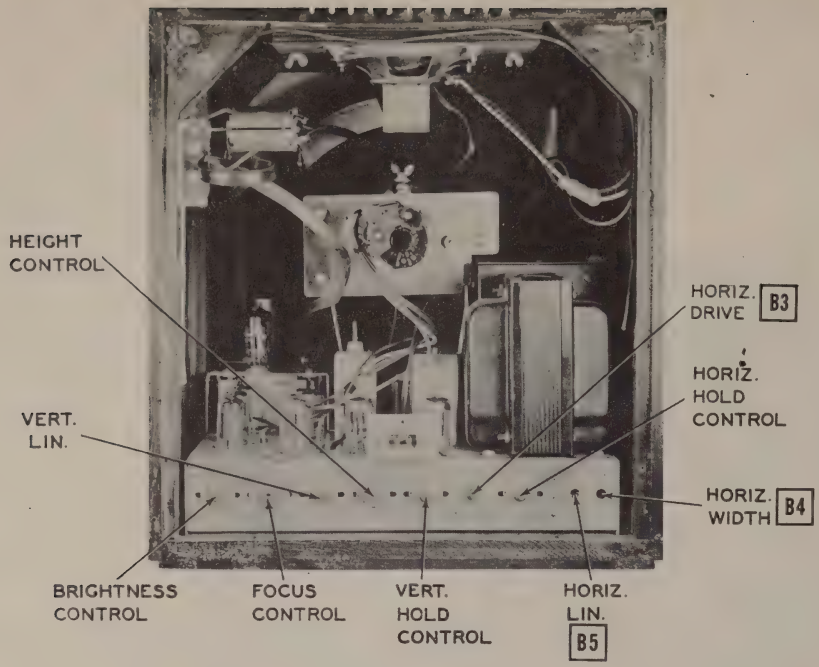
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	†6KΩ	†6KΩ	0Ω	.1Ω	230KΩ	230KΩ	0Ω		
V 2	6J6	†10KΩ	†10KΩ	.1Ω	0Ω	1 Meg.	1 Meg.	0Ω		
V 3	6J6	†6KΩ	†6KΩ	0Ω	.1Ω	100KΩ	100KΩ	47Ω		
V 4	6AU6	230KΩ	0Ω	0Ω	.1Ω	†5KΩ	†5KΩ	47Ω		
V 5	6AU6	230KΩ	0Ω	0Ω	.1Ω	†5KΩ	†5KΩ	47Ω		
V 6	6AU6	.2Ω	0Ω	0Ω	.1Ω	†18KΩ	†5KΩ	150Ω		
V 7	12AU7	10KΩ	10KΩ	.2Ω	.1Ω	.1Ω	†7.2KΩ	10KΩ	0Ω	0Ω
V 8	12AU7	†4KΩ	1 Meg.	10KΩ	.1Ω	.1Ω	†50KΩ	1 Meg.	330KΩ	0Ω
V 9	6AU6	33KΩ	0Ω	.1Ω	0Ω	†10KΩ	†50KΩ	0Ω		
V 10	6AL5	Inf.	Inf.	.1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 11	6AV6	4.7 Meg.	0Ω	0Ω	.1Ω	0Ω	0Ω	†470KΩ		
V 12	6AQ5	♦100KΩ	♦330Ω	0Ω	.1Ω	†800Ω	†450Ω	♦100KΩ		
V 13	12AU7	†47KΩ	1 Meg.	10KΩ	.1Ω	.1Ω	†5KΩ	2.3 Meg.	2.2KΩ	0Ω
V 14	6SN7GT	2.4 Meg. 1.1 Meg.	#3.5 Meg. #1 Meg.	0Ω	2.2Meg.	#2.8KΩ	5KΩ 5Ω	.1Ω	0Ω	
V 15	6SN7GT	1 Meg.	#150KΩ #120KΩ	300KΩ	250KΩ	#110KΩ	0Ω	.1Ω	0Ω	
V 16	6BQ6GT	Inf.	.1Ω	#38Ω	†19KΩ	470KΩ	†200Ω	0Ω	100Ω	TOP CAP #130Ω
V 17	6W4GT	140KΩ	150KΩ	180KΩ	Inf.	†200Ω	140KΩ	Inf.	Inf.	
V 18	1X2	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #410Ω
V 19	5V4G	Inf.	40KΩ	Inf.	45Ω	Inf.	41Ω	Inf.	40KΩ	
V 20	10BP4	0Ω	800KΩ	PIN 10 †500Ω	PIN 11 42KΩ 15KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 8 OF V19.
# MEASURED FROM PIN 3 OF V17.
♦ MEASURED FROM PIN 6 OF V4.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



TOR AND ALIGNMENT IDENTIFICATION



CABINET-REAR VIEW

HORIZONTAL OSCILLATOR ADJUSTMENTS

Connect a short across terminals "C and D" of L18.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Remove the short and connect the vertical amplifier of an oscilloscope to terminal "D" of L18.

Adjust the waveform adjustment slug (B2) until the broad and sharp peaks are of equal amplitude as shown in figure 4. If necessary, readjust the hold control so picture remains in sync.

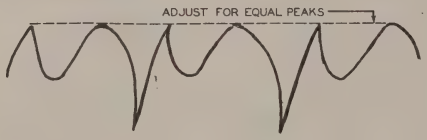


FIG. 4

HORIZONTAL LINEARITY ADJUSTMENTS

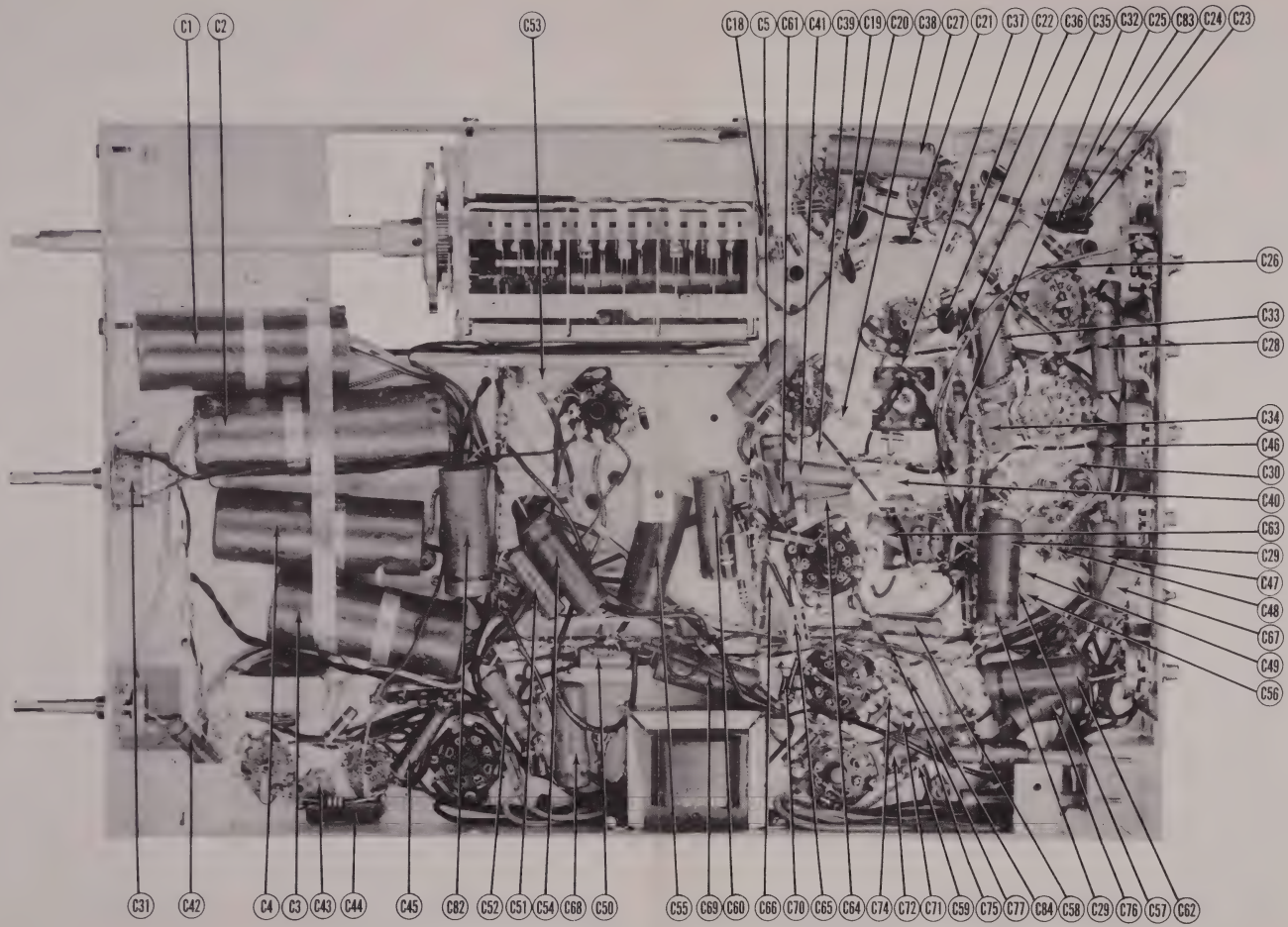
Turn the horizontal drive trimmer (B3) clockwise as far as possible without causing fold-over in the raster.

Adjust the width slug (B4) until the picture fills the mask horizontally.

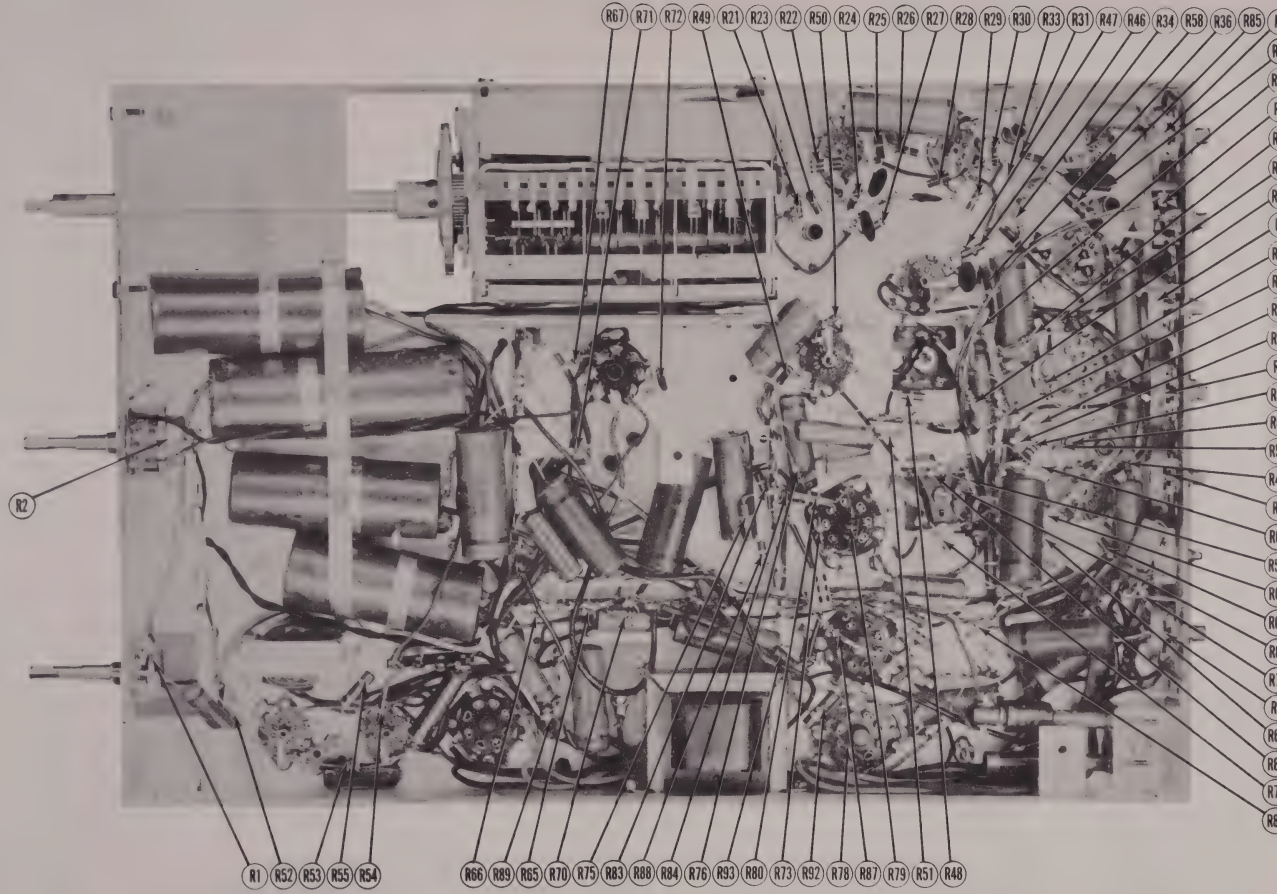
Adjust the horizontal linearity slug (B5) until the picture is symmetrical from left to right. Readjustment of B3 may be necessary while making this adjustment.

DISASSEMBLY INSTRUCTIONS

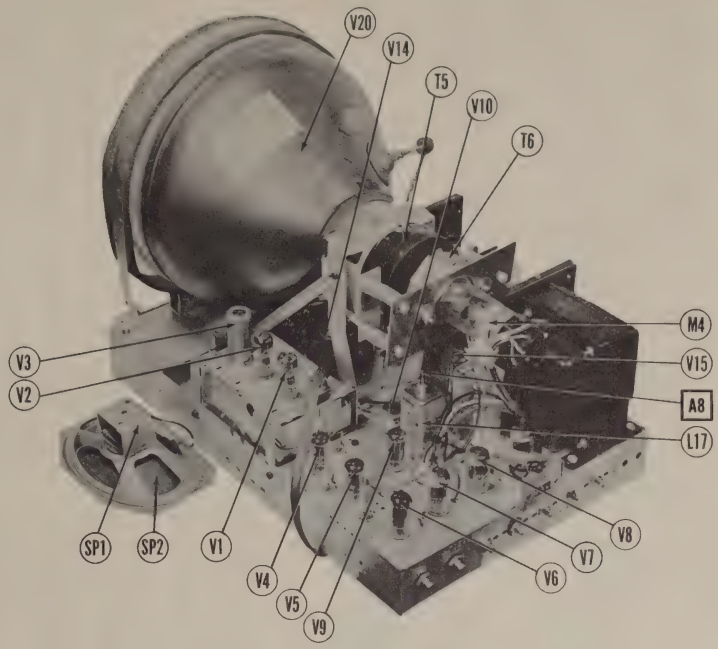
1. Remove three front and one side push-on type control knobs.
2. Remove seven phillips head screws and one 1/4" hex head bolt holding rear cover. Remove cover.
3. Disconnect speaker plug.
4. Remove two wing nuts holding speaker mounting board. Remove speaker on board.
5. Loosen antenna terminal screws and remove built-in antenna if used.
6. Remove two phillips head screws holding antenna terminal strip.
7. Remove one 1/2" hex nut holding antenna trimmer. Remove trimmer from mounting and push aside.
8. Remove five screws holding TV chassis. Remove chassis.



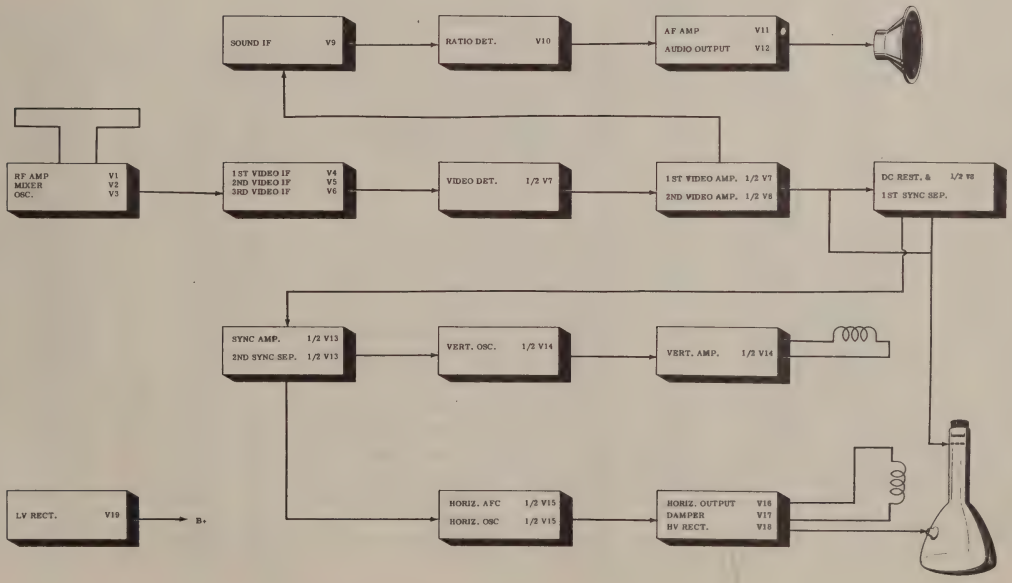
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS-TOP VIEW



BLOCK DIAGRAM

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA HALLICRAFTERS PART No.	REPLACEMENT DATA STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6J6	6J6	7BF	
V2	Mixer	6J6	6J6	7BF	
V3	Oscillator	6J6	6J6	7BF	
V4	1st Video IF	6AU6	6AU6	7BK	
V5	2nd Video IF	6AU6	6AU6	7BK	
V6	3rd Video IF	6AU6	6AU6	7BK	
V7	Video Det.-1st Video Amp.	12AU7	12AU7	9A	
V8	2nd Video Amp.-DC Restorer-1st Sync. Sep.	12AU7	12AU7	9A	
V9	Sound IF	6AU6	6AU6	7BK	
V10	Ratio Det.	6AL5	6AL5	6BT	
V11	AF Amp.	6AV6	6AV6	7BT	
V12	Audio Output	6AQ5	6AQ5	7BZ	
V13	Sync. Amp.-2nd Sync. Sep.	12AU7	12AU7	9A	
V14	Vert. Osc.-Vert. Amp.	6SN7GT	6SN7GT	8BD	
V15	Hor. AFC-Hor. Osc.	6SN7GT	6SN7GT	8BD	
V16	Hor. Output	6BQ6GT	6BQ6GT	6AM	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1X2	1X2	7CB	
V19	LV Rectifier	5V4G	5V4G	5L	
V20A	Picture Tube	10BP4	10BP4	12D	Model 600
B	Picture Tube	12LP4	12LP4	12D	Models 518, 521, 601, 602
C	Picture Tube	16AP4	16AP4	12D	Models 519, 520, 603, 604

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Hallicrafters PART No.	REPLACEMENT DATA AEROVOX PART No.	REPLACEMENT DATA ERIE PART No.	REPLACEMENT DATA SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	45B137	PRSA450/40-40		TVL-64#	Filter-Red
B	40	450					Filter-Red
C2	80	450	45B158	PRSA450/40-40		TVL-9#	Filter
C3A	10	450	45B157	PRSA2222J		TVL-39#	Decoupling-Red
B	10	450					Decoupling-Red
C	10	450					Output Cathode Bypass-Blue
D	10	450					Decoupling-Yellow
C4A	100	250	45B156	PRSA20F30B			Decoupling-Red
B	150	50					Vert. Output Cathode Bypass-Yel.
C5	5	50	45A109	PRS150/4		TVA-13	Stabilizing Cap.
C6	330		47B20331K5	GP330M	GP2K-330		RF Coupling
C7	330		47B20331K5	GP330M	GP2K-330		RF Coupling
C8	1500		47B20152K5	GP1500M	GP2L-0015		AGC Filter
C9	1.5		47A160-3	C11.5CNPO	NPOK-1.5		Neutralizing
C10	1.5		47A160-3	C11.5CNPO	NPOK-1.5		Neutralizing
C11	500		47B20501K5	GP500M	GP2K-500		RF Filament Bypass
C12	1500		47B20152K5	GP1500M	GP2L-0015		Mixer Grid Filter
C13	4.7		47A160-6	CN4.7DN750	N750K-5		Osc. Feedback
C14	4.7		47A160-6	CN4.7DN750	N750K-5		Osc. Feedback
C15	500		47B20501K5	GP500M	GP2K-500		Osc. Filament Bypass
C16	500		47B20501K5	GP500M	GP2K-500		RF Bypass
C17	1.5		47A160-3	C11.5CNPO	NPOK-1.5		Fixed Trimmer
C18	5000		47A168	BPD-5	811-005	29C1	Mixer Plate Decoupling
C19	5000		47A168	BPD-5	811-005	29C1	AGC Filter
C20	5000		47A168	BPD-5	811-005	29C1	1st V. IF Decoupling
C21	5000		47A168	BPD-5	811-005	29C1	AGC Filter
C22	5000		47A168	BPD-5	811-005	29C1	2nd V. IF Decoupling
C23	5000		47A168	BPD-5	811-005	29C1	3rd V. IF Cathode Bypass
C24	5000		47A168	BPD-5	811-005	29C1	3rd V. IF Decoupling
C25	5000		47A168	BPD-5	811-005	29C1	3rd V. IF Plate Decoupling
C26	5		47B20050K5		NPOK-5	MS-55	V. Diode Filter
C27	.25	200	46AT254J	P488-25		TC-2	AGC Filter
C28	.05	200	46AY503J	P288-05		TM-15	Video Coupling
C29	.1	600	46AU104J	P688-1		TM-1	Video Coupling
C30	47			CN47JNPO	NPOM-50	MS-45	Fixed Trimmer
C31	120	500	47X20AI2IM	1468-00015	GP2K-120	1FM-315	2nd V. Amp. Cathode Bypass
C32	.02	400	46AY203J	P488-02		TM-12	Video Coupling
C33	.25	200	46AT254J	P488-25		TC-2	DC Res. Cathode Bypass
C34	22	500	47X20A220K	1469-000025	GP1K-22	MS-425	Fixed Trimmer
C35	100		47X20A101M	GP100M	GP1K-100	1FM-31	S. IF Coupling
C36	5000		47A168	BPD-5	811-005	29C1	S. IF Screen Bypass
C37	5000		47A168	BPD-5	811-005	29C1	S. IF Plate Decoupling
C38	330		47B20331K5	GP330M	GP2K-330	1FM-335	Diode Load Cap. *
C39	330		47B20331K5	GP330M	GP2K-330	1FM-335	Diode Load Cap. *
C40	1000		47B20102M5	GP1000M	GP2L-001	1FM-21	De-emphasis
C41	.01	200	46AU502J	P488-01	821-01	TM-11	Audio Coupling †
C42	.01	400	46AU103J	P488-01	821-01	TM-11	Audio Coupling
C43	330	500	47X20A331M	1468-00035	GP2K-330	1FM-335	AF Amp. Plate Bypass
C44	.01	600	46AY103J	P688-01	821-01	TM-11	Audio Coupling
C45	.01	600	46AY103J	P688-01	821-01	TM-11	Output Plate Bypass
C46	.01	200	46AU103J	P488-01	821-01	TM-11	Sync. Coupling
C47	.1	200	46AU104J	P288-1		TM-1	2nd Sync. Amp. Cathode Bypass
C48	100		47X20A101M	GP100M	GP1K-100	1FM-31	Sync. Coupling
C49	1000	500	47X20A102M	1468-001	GP2L-001	1FM-21	2nd Sync. Sep. Cathode Bypass
C50	.002	600	46AZ202J	P688-002	GP2M-002	TM-22	Integrator Net.
C51	.005	200	46AU502J	P688-005	811-005	TM-25	Integrator Net.
C52	.005	200	46AU502J	P688-005	811-005	TM-25	Integrator Net.
C53	4700	500	47X35A472M	1467-005	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C54	.1	600	46AU104J	P688-1		TM-1	Vert. Discharge
C55	.25	600	46AX254J	684-25		TC-2	Vert. Sweep Coupling
C56	180	500	47X20A181M	1468-0002	GP2K-180	1FM-32	Hor. Sync. Coupling
C57	220	500	4720A221M	1468-00025	GP2K-220	1FM-325	Voltage Divider

CAPACITOR

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT Hallicrafters PART No.	REPLACEMENT AEROVOX PART No.	REPLACEMENT PA
C58	.002	600	46AZ202J	P688-002	GP2
C59	5		47B20050K5	CI5DNPO	NPO
C60	.25	200	46AT254J	P488-25	
C61	.02	600	46AY203J	P688-02	
C62	.1	600	46AU104J	P688-1	
C63	390	500	47X20A391M	1468-0004	GP2
C64	10000	300	47X35A103K	1467-01	821-
C65	1000	500	47X20A102M	1468-001	GP2
C66	1000	500	47X20A102M	1468-001	GP2
C67	390	500	47X20A391M	1468-0004	GP2
C68	.05	600	47AY503J	P688-05	
C69	.25	200	46AT254J	P488-25	
C70	1000		47B20102M5	GP1000M	GP2
C71	68			GP68M	GP1
C72	68			GP68M	GP1
C73	.1	200	46AU104J	P288-1	
C74	1000		47B20102M5	GP1000M	GP2
C75	.05	600	46AY503J	P688-05	
C76	.035	600	46AY353J	P688-033	
C77	1000		47B20102M5	GP1000M	GP2
C78	500	20000	47A216		
C79	500	20000	47A216		
C80	.01	600	46BR103L6	P688-01	821-
C81	.01	600	46BR103L6	P688-01	821-
C82	.5	200	46AT254J	P288-5	
C83	.1	200	46AU104J	P288-1	
C84	1000		47B20102M5	GP1000M	GP2

* When either item C38 or C39 are replaced, replace both
† Some models use .05MFD in this application.
‡ Not used in all models.
§ Some models use .25MFD in this application.
# Use mounting strap.
♦ Parallel sections to obtain desired capacity.

CO

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Hallicrafters PART No.	REPLACEMENT DATA IRC PART No.	CLA PA
R1A	1 Meg.	½	25A856	QI3-137	AM-
B	Shaft		Not Req.	Not Req.	KSS
R2	10KΩ	2	25B790		25B
R3	50KΩ	½	25A858	QI1-123	M-4
R4	2500Ω	2	25B710	W-3000	43-3
R5	5000Ω		25B712	QI1-114	M-1
R6	2.5 Meg.		25B711	QI1-239	M-8
R7	1 Meg.		25A857	QI1-137	M-6
R8	50KΩ	½	25A858	QI1-123	M-4

RE

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA HALLICRAFTER PART No.	REPLACEMENT DATA IRC PART No.
R9	150Ω		23X20X151K	
R10	150Ω		23X20X151K	
R11	10KΩ		23X20X103K	BTS-10K
R12	1000Ω 20%		23X20X102K	BTS-1000
R13	1000Ω 20%		23X20X102K	BTS-1000
R14	1000Ω 20%		23X20X102K	BTS-1000
R15	5600Ω		23X20X562K	BTS-5600
R16	1 Meg. 20%		23X20X105K	BTS-1 Meg.
R17	100KΩ 20%		23X20X104K	BTS-100K
R18	100KΩ 20%		23X20X104K	BTS-100K
R19	1000Ω 20%		23X20X102K	BTS-1000
R20	1000Ω 20%		23X20X102K	BTS-1000
R21	33Ω		23X20X330K	
R22	4700Ω		23X30X472K	
R23	15KΩ		23X20X153K	
R24	47Ω		23X20X470K	
R25	15KΩ		23X20X153K	
R26	100Ω		23X20X101K	
R27	150Ω		23X20X151K	
R28	150Ω		23X20X151K	
R29	47Ω		23X20X470K	
R30	15KΩ		23X20X153K	
R31	100Ω		23X20X101K	
R32	150Ω		23X20X151K	
R33	220KΩ		23X20X224K	BTS-220K
R34	10KΩ		23X20X103K	BTS-10K
R35	22KΩ		23X20X223K	BTS-22K
R36	2200Ω		23X30X222K	BTA-2200
R37	1 Meg. 20%		23X20X105M	BTS-1 Meg.
R38	4700Ω		23X40X472K	BT-2-4700
R39	330KΩ		23X20X334K	BTS-330K
R40	47KΩ		23X20X473K	BTS-47K
R41	1 Meg. 20%		23X20X105M	BTS-1 Meg.
R42	47KΩ		23X20X473K	BTS-47K
R43	470KΩ 20%		23X20X474M	BTS-470K
R44	33KΩ		23X20X333K	BTS-33K
R45	10KΩ		23X20X103K	BTS-10K
R46	100KΩ 20%		23X20X104M	
R47	47KΩ		23X20X473K	BTS-47K
R48	150Ω		23X20X151K	

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA HALLICRAFTERS PART No.	STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp	6J6	6J6	7BF	
V2	Mixer	6J6	6J6	7BF	
V3	Oscillator	6J6	6J6	7BF	
V4	1st Video IF	6AU6	6AU6	7BK	
V5	2nd Video IF	6AU6	6AU6	7BK	
V6	3rd Video IF	6AU6	6AU6	7BK	
V7	Video Det.-1st Video Amp.	12AU7	12AU7	9A	
V8	2nd Video Amp.-DC Restorer-1st Sync. Sep.	12AU7	12AU7	9A	
V9	Sound IF	6AU6	6AU6	7BK	
V10	Ratio Det.	6AL5	6AL5	6BT	
V11	AF Amp.	6AV6	6AV6	7BT	
V12	Audio Output	6AQ5	6AQ5	7BZ	
V13	Sync. Amp.-2nd Sync. Sep.	12AU7	12AU7	9A	
V14	Vert. Osc.-Vert. Amp.	6SN7GT	6SN7GT	8BD	
V15	Hor. AFC-Hor. Osc.	6SN7GT	6SN7GT	8BD	
V16	Hor Output	6BQ6GT	6BQ6GT	6AM	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1X2	1X2	7CB	
V19	LV Rectifier	5V4G	5V4G	5L	
V20A	Picture Tube	10BP4	10BP4	12D	Model 600
B	Picture Tube	12LP4	12LP4	12D	Models 518, 521, 601, 602
C	Picture Tube	16AP4	16AP4	12D	Models 519, 520, 603, 604

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Hallicrafters PART No.	AEROVOX PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	45B157	PRSA450/40-40		TVL-644	Filter-Red
B	40	450					Filter-Red
C2	40	450	45B158	PRSA450/40-40		TVL-394	Filter
C3A	10	450	45B157	PRSA2222J		TVL-398	Decoupling-Red
B	10	450					Decoupling-Red
C	10	450					Output Cathode Bypass-Blue
D	10	450					Decoupling-Yellow
C4A	100	250	45B156	PRSA20F30B			Decoupling-Red
B	150	50					Vert. Output Cathode Bypass-Yel, Stabilizing Cap.
C5	5	50	45A109	PRS150/4		TVA-13	RF Coupling
C6	330		47B20331K5	GP330M	GP2K-330		RF Coupling
C7	330		47B20331K5	GP330M	GP2K-330		AGC Filter
C8	1500		47B20152K5	GP1500M	GP2L-0015		Neutralizing
C9	1.5		47A160-3	CH 5CNPO	NPOK-1.5		Neutralizing
C10	1.5		47A160-3	CH 5CNPO	NPOK-1.5		RF Filament Bypass
C11	500		47B20501K5	GP500M	GP2K-500		Mixer Grid Filter
C12	1500		47B20152K5	GP1500M	GP2L-0015		Osc. Feedback
C13	4.7		47A160-6	CH4.7DNT50	N750K-5		Osc. Feedback
C14	4.7		47A160-6	CH4.7DNT50	N750K-5		Osc. Platemt Bypass
C15	500		47B20501K5	GP500M	GP2K-500		RF Bypass
C16	500		47B20501K5	GP500M	GP2K-500		Fixed Trimmer
C17	1.5		47A160-3	CH 5CNPO	NPOK-1.5		Mixer Plate Decoupling
C18	5000		47A168	BPD-5	81L-005	29C1	AGC Filter
C19	5000		47A168	BPD-5	81L-005	29C1	1st V. IF Decoupling
C20	5000		47A168	BPD-5	81L-005	29C1	AGC Filter
C21	5000		47A168	BPD-5	81L-005	29C1	2nd V. IF Decoupling
C22	5000		47A168	BPD-5	81L-005	29C1	3rd V. IF Cathode Bypass
C23	5000		47A168	BPD-5	81L-005	29C1	3rd V. IF Decoupling
C24	5000		47A168	BPD-5	81L-005	29C1	2nd V. IF Plate Decoupling
C25	5000		47A168	BPD-5	81L-005	29C1	3rd V. IF Plate Decoupling
C26	5		47B20505K5		NPOK-5	MS-55	V. Diode Filter
C27	.25	200	45A7S42	P488-25		TC-2	AGC Filter
C28	.05	200	45AY503J	P288-05		TM-15	Video Coupling
C29	.1	600	45AU104J	P588-1		TM-1	Video Coupling
C30	47			CM47NPO	NPOM-50	MG-45	2nd V. Amp. Cathode Bypass
C31	120	500	47X20A121M	1468-00015	GP2K-120	1FM-315	2nd V. IF Decoupling
C32	.02	400	46AY203J	P488-02		TM-12	Video Coupling
C33	.25	200	46A7S42	P488-25		TC-2	DC Res. Cathode Bypass
C34	22	500	47X20A220K	1469-000025	GP1K-22	MS-425	Fixed Trimmer
C35	100		47X20A101M	GP100M	GP1K-100	1FM-31	S. IF Coupling
C36	5000		47A168	BPD-5	81L-005	29C1	S. IF Screen Bypass
C37	5000		47A168	BPD-5	81L-005	29C1	S. IF Plate Decoupling
C38	330		47B20331K5	GP330M	GP2K-330	1FM-335	Diode Load Cap. *
C39	330		47B20331K5	GP330M	GP2K-330	1FM-335	Diode Load Cap. *
C40	1000		47B20102M5	GP1000M	GP2L-001	1FM-21	De-emphasis
C41	.02	200	46AS302J	P488-01	821-01	TM-11	Audio Coupling †
C42	.02	400	46AU03J	P488-01	821-01	TM-11	Audio Coupling
C43	500	100	47X20A331M	1468-00035	GP2K-330	1FM-325	AF Amp. Plate Bypass
C44	.01	600	46AY103J	P688-01	821-01	TM-11	Audio Coupling
C45	.01	600	46AY103J	P688-01	821-01	TM-11	Output Plate Bypass
C46	.01	200	46AU103J	P488-01	821-01	TM-11	Sync. Coupling
C47	.1	200	46AU104J	P288-1		TM-1	2nd Sync. Amp. Cathode Bypass
C48	100		47X20A101M	GP100M	GP1K-100	1FM-31	Sync. Coupling
C49	1000	500	47X20A102M	1468-001	GP2L-001	1FM-21	2nd Sync. Sep. Cathode Bypass
C50	.002	600	46AZ202J	P688-002		GP2M-002	TM-22 Integrator Net.
C51	.005	200	46AL502J	P688-005	811-005	TM-25	Integrator Net.
C52	.005	200	46AC502J	P688-005	811-005	TM-25	Integrator Net.
C53	4700	500	47X35A472M	1467-005	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C54	.1	600	46AU104J	P688-1		TM-1	Vert. Discharge
C55	.25	600	46AX2S42	684-25		TC-2	Vert. Sweep Coupling
C56	180	500	47X20A181M	1468-0002	GP2K-180	1FM-32	Hor. Sync. Coupling
C57	220	500	4720A221M	1468-00025	GP2K-220	1FM-325	Voltage Divider

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Hallicrafters PART No.	AEROVOX PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C58	.002	600	46AZ202J	P688-002	GP2M-002	TM-22	Hor. Sync. Coupling
C59	5		47B20505K5	C15CNPO	NPOK-5	MS-55	Ratio Det. Feedback
C60	.25	200	46AT254J	P488-25		TC-2	AFC Filter
C61	.02	600	46AY203J	P688-02		TM-12	AFC Filter
C62	.1	600	46AU104J	P688-1		TM-1	AFC Plate Bypass
C63	390	500	47X20A391M	1468-0004	GP2K-390	1FM-34	Hor. Osc. Grid Cap.
C64	10000	300	47X35A103K	1467-01	821-01	1FM-11	Fixed Trimmer
C65	1000	500	47X20A102M	1468-001	GP2L-001	1FM-21	Hor. Discharge
C66	1000	500	47X20A102M	1468-001	GP2L-001	1FM-21	Hor. Sweep Coupling
C67	390	500	47X20A390M	1468-0004	GP2K-390	1FM-34	Voltage Divider
C68	.05	600	47AY503J	P688-05		TM-15	Hor. Output Screen Bypass
C69	.25	200	46AT254J	P488-25		TC-2	Hor. Output Cathode Bypass
C70	1000		47B20102M5	GP1000M	GP2L-001	1FM-21	Hor. Output Cathode Bypass †
C71	68			GP68M	GP1K-68	MS-47	Hor. Feedback
C72	68			GP68M	GP1K-68	MS-47	Hor. Feedback
C73	.1	200	46AU104J	P288-1		TM-1	Fixed Trimmer
C74	1000		47B20102M5	GP1000M	GP2L-001	1FM-21	Fixed Trimmer †
C75	.05	600	46AY503J	P688-05		TM-15	Damper Filter
C76	.035	600	46AY353J	P688-033			Damper Filter
C77	1000		47B20102M5	GP1000M	GP2L-001	1FM-21	Damper Filter †
C78	500	20000	47A216				HV Filter
C79	500	20000	47A216				HV Filter
C80	.01	600	46BR103L6	P688-01	821-01	TM-11	Line Filter
C81	.01	600	46BR103L6	P688-01	821-01	TM-11	Line Filter
C82	.5	200	46AT254J	P288-5		TC-5	Hor. Sweep Coupling ‡
C83	.1	200	46AU104J	P288-1		TM-1	Pic. Tube Cathode Decoupling
C84	1000		47B20102M5	GP1000M	GP2L-001	1FM-21	Hor. Output Screen Bypass †

* When either C38 or C39 are replaced, replace both with capacitors of equal value.
† Some models use .05MFD in this application.
‡ Not used in all models.
◊ Some models use .25MFD in this application.
Use mounting strap.
♦ Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Hallicrafters PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	1	25A856	Q13-137	AM-63-Z	Volume control
B	Shaft		Not Req.	Not Req.	KS8-3	Attach to R1A per instructions
R2	10KΩ	2	25B790		25B790	Contrast control and switch-Wire Wound
R3	50KΩ	1	25A858	Q11-123	M-44-S	Brightness control
R4	2500Ω	2	25B710	W-3000	43-3000	Focus Control-Wire Wound
R5	5000Ω	1	25B712	Q11-114	M-39-S	Vert. linearity control
R6	2.5 Meg.		25B711	Q11-239	M-84-S	Height control
R7	1 Meg.		25A857	Q11-137	M-61-S	Vert. hold control
R8	50KΩ	1	25A858	Q11-123	M-44-S	Horiz. hold control

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA HALLICRAFTERS PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R9	150Ω	1	23X201S1K		RF Grid
R10	150Ω	1	23X201S1K		RF Grid
R11	10KΩ	1	23X201X103K	BTS-10K	RF Plate Coil Shunt
R12	1000Ω 20%	1	23X201X103K	BTS-1000	RF Plate
R13	1000Ω 20%	1	23X201X103K	BTS-1000	RF Plate
R14	1000Ω 20%	1	23X201X102K	BTS-1000	AGC Network
R15	5600Ω	1	23X201X562K	BTS-5600	Mixer Grid Shunt
R16	1 Meg. 20%	1	23X201X105K	BTS-1 Meg.	Mixer Grid
R17	100KΩ 20%	1	23X201X104K	BTS-100K	Osc. Grid
R18	100KΩ 20%	1	23X201X104K	BTS-100K	Osc. Grid
R19	1000Ω 20%	1	23X201X102K	BTS-1000	Osc. Plate
R20	1000Ω 20%	1	23X201X102K	BTS-1000	Osc. Plate
R21	33Ω	1	23X201X330K		Parasitic Supp.
R22	4700Ω	1	23X201X472K		Mixer Plate Decoupling
R23	15KΩ	1	23X201X153K		1st Video IF Transformer Shunt
R24	47Ω	1	23X201X470K		1st Video IF Cathode
R25	15KΩ	1	23X201X153K		2nd Video IF Transformer Shunt Decoupling
R26	100Ω	1	23X201X101K		AGC Network
R27	150Ω	1	23X201X151K		AGC Network
R28	150Ω	1	23X201X151K		2nd Video IF Cathode
R29	47Ω	1	23X201X470K		3rd Video IF Transformer Shunt
R30	15KΩ	1	23X201X153K		Decoupling
R31	100Ω	1	23X201X101K		3rd Video IF Cathode
R32	150Ω	1	23X201X151K		Audio Coupling
R33	220KΩ	1	23X201X224K	BTS-220K	AGC Network
R34	10KΩ	1	23X201X103K	BTS-10K	Video Det. Load
R35	22KΩ	1	23X201X223K	BTS-22K	Peaking Coil Shunt
R36	2200Ω	1	23X3X222K	BTA-2200	1st Video Amp. Plate
R37	1 Meg. 20%	1	23X201X105M	BTS-1 Meg.	2nd Video Amp. Grid-See Note 1
R38	4700Ω	2	23X20X472K	BT-2-4700	2nd Video Amp. Plate
R39	330KΩ	1	23X201X334K	BTS-330K	DC Rest. Load
R40	47KΩ	1	23X201X473K	BTS-47K	1st Sync. Sep. Grid
R41	1 Meg. 20%	1	23X201X105M	BTS-1 Meg.	1st Sync. Sep. Grid
R42	47KΩ	1	23X201X473K	BTS-47K	1st Sync. Sep. Plate-See Note 4
R43	470KΩ 20%	1	23X201X474M	BTS-470K	Picture Tube Grid
R44	33KΩ	1	23X201X333K	BTS-33K	Sound IF Grid
R45	10KΩ	1	23X201X103K	BTS-10K	Sound IF Plate Decoupling
R46	100KΩ 20%	1	23X201X104M		Sound IF Screen
R47	47KΩ	1	23X201X473K	BTS-47K	Voltage Divider
R48	15KΩ	1	23X201X153K		Balancing

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Hallicrafters PART No.	IRC PART No.	IDENTIFICATION CODES
R49	10KΩ 5%	1	23X20X103J	BTS-10K-5%	Ratio Det. Diode Load
R50	10KΩ 5%	1	23X20X103J	BTS-10K-5%	Ratio Det. Diode Load
R51	33KΩ	1	23X20X333K	BTS-33K	De-emphasis
R52	4.7Meg. 20%	1	23X20X475M	BTS-4.7 Meg.	AF Grid
R53	470KΩ 20%	1	23X20X474M	BTS-470K	AF Plate
R54	100KΩ 20%	1	23X20X104M	BTS-100K	Output Grid
R55	330Ω	1	23X30X331K	BTA-330	Output Cathode
R56	5000Ω	10	24DG502E	AB-5000	Filter-Wire Wound
R57	180KΩ	1	23X20X184M	BTS-180K	Voltage Divider
R58	150KΩ	1	23X20X153K	BTS-150K	Voltage Divider-See Note 5
R59	1 Meg. 20%	1	23X30X105M	BTS-1 Meg.	Sync. Amp. Grid
R60	10KΩ	1	23X20X103K	BTS-10K	Sync. Amp. Cathode
R61	47KΩ	1	23X20X473K	BTS-47K	Sync. Amp. Plate
R62	2.2 Meg.	1	23X20X225K	BTS-2.2 Meg.	2nd Sync. Sep. Grid
R63	2200Ω	1	23X20X222K	BTS-2200	2nd Sync. Sep. Cathode
R64	22KΩ	1	23X20X223K	BTS-22K	Integrator
R65	8200Ω	1	23X20X822K	BTS-8200	Integrator
R66	8200Ω	1	23X20X822K	BTS-8200	Integrator
R67	1 Meg.	1	23X20X105K	BTS-1 Meg.	Vert. Osc. Grid-See Note 2
R68	5.8 Meg.	1	23X20X585M	BTS-5.8 Meg.	Voltage Divider-See Note 3
R69	100KΩ	1	23X30X104K	BTS-100K	Voltage Divider-See Note 3
R70	1 Meg.	1	23X20X105M	BTS-1 Meg.	Vert. Osc. Plate
R71	3300Ω	1	23X20X332K	BTS-3300	Vert. Peaking
R72	2.2 Meg.	1	23X20X225M	BTS-2.2 Meg.	Vert. Amp. Grid
R73	820KΩ 20%	1	23X20X824M	BTS-820K	Horiz. AFC Grid
R74	150KΩ 20%	1	23X20X154M	BTS-150K	Horiz. AFC Cathode
R75	150KΩ	1	23X30X154M	BTA-150K	Horiz. AFC Cathode
R76	8200Ω	1	23X20X822K	BTS-8200	Horiz. AFC Filter Network
R77	82KΩ	1	23X20X823K	BTS-82K	Voltage Divider
R78	120KΩ 20%	1	23X20X124M	BTS-120K	Voltage Divider
R79	2.7 Meg.	1	23X30X275M	BTA-2.7 Meg.	Voltage Divider
R80	100KΩ	1	23X20X104K	BTS-100K	Horiz. Osc. Grid
R81	8200Ω	1	23X20X822K	BTS-8200	Horiz. Osc. Transformer Shunt
R82	22KΩ	1	23X20X223K	BTS-22K	Horiz. Osc. Transformer Shunt
R83	120KΩ 20%	1	23X20X124M	BTS-120K	Horiz. Osc. Plate
R84	150KΩ	1	23X20X154M	BTS-150K	Horiz. Osc. Filter Network
R85	18KΩ	1	23X30X183K	BTA-18K	Decoupling
R86	560KΩ	1	23X20X564K	BTS-560K	Feedback
R87	47Ω	1	23X20X470K		Parasitic Supp.
R88	470KΩ 20%	1	23X20X474M	BTS-470K	Horiz. Output Grid
R89	100Ω	1	23X30X101K	BW-1-100	Horiz. Output Cathode
R90	39KΩ	2	23X40X393K	BT-2-39K	Horiz. Output Screen
R91	39KΩ	2	23X40X393K	BT-2-39K	Horiz. Output Screen
R92	10KΩ	1	23X30X103K	BTA-10K	Filter
R93	2200Ω	1	23X30X222K	BTA-2200	Decoupling
R94	1 Meg.	1	23X30X105K		HV Filter
R95	200Ω	10	24BH201E	AB-200	Filter-Wire Wound
R96	39Ω	1	23X20X390K		Parasitic Supp.-See Note 3
R97	47Ω	1	23X20X470K		Osc. Cathode
R98	560Ω	1	23X20X562K	BTA-5600	Voltage Divider -See Note 6

Note 1. Some models use 220KΩ resistor in this application.
Note 2. Some models use 1.2 Meg. resistor in this application.
Note 3. Not used in all models.
Note 4. Models 603 and 604 use 27KΩ resistor in this application.
Note 5. Models 603 and 604 use 22KΩ resistor in this application.
Note 6. Used in models 603 and 604 only.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	REPLACEMENT DATA SEC. 2	SEC. 3	HALLICRAFTERS PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ① 1.35A ②	670VCT .170 ADC	5VAC ② 2A	6.3VAC ② 7.4A SEC. 4 6.2VAC ③ 1.2A	52C185	-		

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	DC RESISTANCE SEC.	REPLACEMENT DATA HALLICRAFTER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	200Ω	1200Ω	55B115	A-8111	A-3000	TSO-1	Vert. Block Osc. Trans.
T3	34Ω	SEC. 1 59C133					Hor. Output Trans.
	Tap ② 48Ω	50 Tap ② , 2Ω & 4, Hi					
T4	100Ω Tap ② 12, 5Ω		55A128	A-8112	A-3037	TSO-5	Vert. Output Trans.
T5A	15Ω		53A180	DY-1			Hor. Deflection Coil
B	68Ω						Vert. Deflection Coil
T6A	100Ω		51B157 ①				Focus Coil
B			51B158 ②				Focus Coil
C			51B159 ③				Focus Coil

① Used in model 600
② Used in models 601 and 602.
③ Used in models 603 and 604.

HALLICRAFTERS MODELS 518, 519, 520, 521, 600, 601, 602, 603, 604

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		Hallicrafters	STANCOR	MERIT	CHICAGO	
	PRI.	SEC.	PRI.	SEC.	PART No.	PART No.	PART No.	PART No.	
T7	6.6KΩ	3.5Ω	365Ω	.5Ω	55C134	A-3878	A-2931	RO-13	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	HALLICRAFTER PART No.	VIKING PART No.	QUAM PART No.	
SP1A B	PM	3.5Ω	85A095 ④ 85C096 ⑤	46J6	46A1	④ Used in models 600 and 601. ⑤ Used in models 602, 603, 604.
	CONE DIA.	V. C. DIA.				
SP2	3 7/8" x 5 7/8"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	Hallicrafters PART No.	MEISSNER PART No.	
L1	Ant. Input	0Ω				Part of tuner.
L2	Ant. Coil	0Ω				Part of tuner, low-band
L3	Ant. Coil	0Ω				Part of tuner, high-band
L4	Mixer Grid	0Ω				Part of tuner, low-band
L5	Mixer Grid	0Ω				Part of tuner, high-band
L6	Osc. Coil	0Ω				
L7	Osc. Coil	0Ω				Part of tuner, low-band
L8	1st Video IF	.2Ω	.2Ω	50A431		Part of tuner, high-band
L9	2nd Video IF	.2Ω	.2Ω	50A431		
L10	3rd Video IF	.2Ω	.2Ω	50A431		
L11	4th Video IF	.2Ω	.2Ω	50A431		
L12	Peaking	8.5Ω		51B1154		Wound on 1 Meg. resistor.
L13	Peaking	8.5Ω		51B1154		Wound on 1 Meg. resistor.
L14	Peaking	17Ω		51A1155		Wound on 1 Meg. resistor.
L15	Peaking	10.5Ω		51A1156		Wound on 1 Meg. resistor.
L16	Sound IF	1Ω	.8Ω	50A432		
L17	Ratio Det. Trans.	4.5Ω	1Ω	50B406		
L18	Hor. Osc. Trans.	120Ω	36Ω	51B1153		
L19	Width Cont.	.2Ω		51B1072-1		
L20	Horiz. Linearity	38Ω		51B1071		
L21	Peaking			51A1156		Used in 603 and 604.

MISCELLANEOUS

ITEM No.	PART NAME	HALLICRAFTERS PART No.	NOTES
M1	RF Tuner	1C834	Complete
M2	Fuse	39A340	3A
M3	Fuse	39A338	.25A, 250V (Not used in all models)
M4	Ion Trap	21A093	Permanent Magnet Type
	Cabinet Back	8D944	Model 600
	Cabinet Back	8D947	Model 601
	Safety Glass	22D256	Model 600
	Safety Glass	22D255	Model 601
	Safety Glass	22A260	Model 602
	Knob	15B180	On-Off, Contrast
	Knob	15B181	Channel Selector
	Knob	15B182	Fine Tuning
	Trimmer	44A361	Horiz. Drive

PHOTOFACT* Folder

MOTOROLA MODELS 10T2, 10VK12, 10VK22, 10VT10, 10VT24, 12K1, 12K2, 12T1, 12VF4, 12VF26, 12VK11, 12VT13

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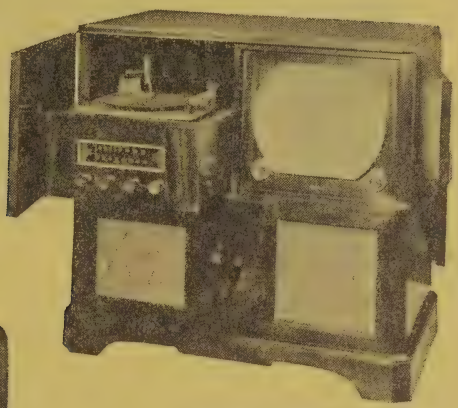

MODEL 12VF4R

MODEL 10VK22

MOTOROLA MODELS 10T2, 10VK12, 10VK22, 10VT10, 10VT24, 12K1, 12K2, 12T1, 12VF4, 12VF26, 12VK11, 12VT13

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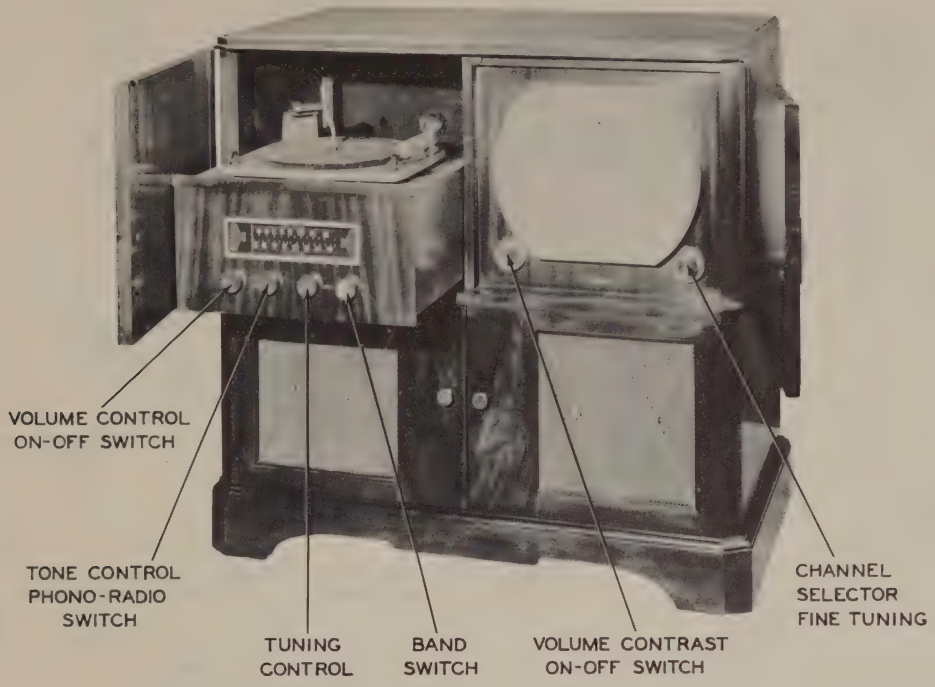

MOTOROLA MODELS 10T2, 10VK12, 10VK22, 10VT10, 10VT24, 12VF4, 12VK11, 12VT13

MOTOROLA MODEL 12VF4R

TRADE NAME	Motorola, Models 10T2, 10VK12, 10VK22, 10VT10, 10VT24 (Ch. TS14, A, B), 12K1, 12K2, 12T1, 12VF4, 12VF26, 12VK11, 12VT23 (Ch. TS23, A, B)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Illinois
TYPE SET	Television Receiver (Model 12VF4R Also Has AM-FM Radio Chassis HS-178)
TUBES	Nineteen ("TV Only" Models) Twenty Five (Model 12VF4R)
POWER SUPPLY	110-120 Volts AC-60 Cycle
TUNING RANGE	Channels 2 thru 13 — RATING 1.35 Amp. at 117 Volts AC (TV Only).

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FOR SERVICE INFORMATION ON RADIO CHASSIS HS-190, A SEE CHASSIS HS-178 PHOTOFACT SET #88 - FOLDER #7

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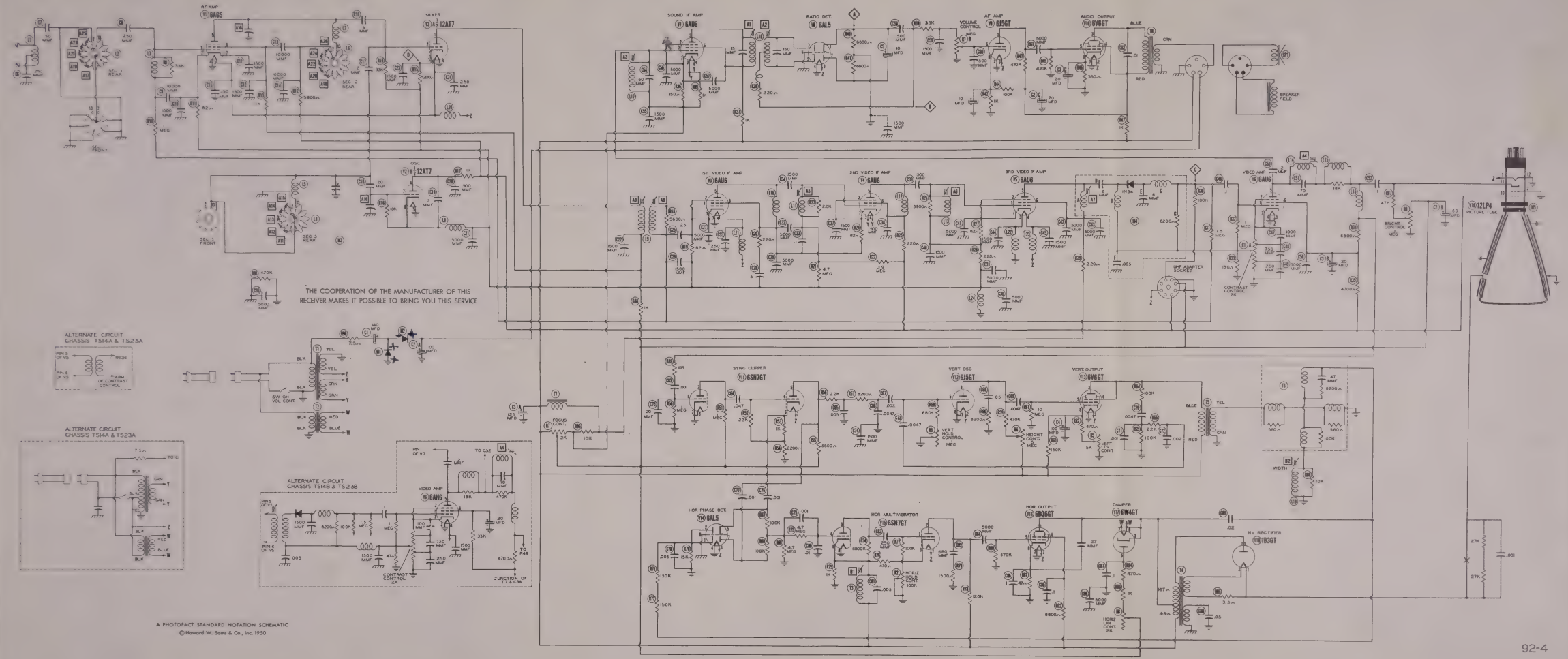
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ALTERNATE CIRCUIT CHASSIS TS14B & TS23B
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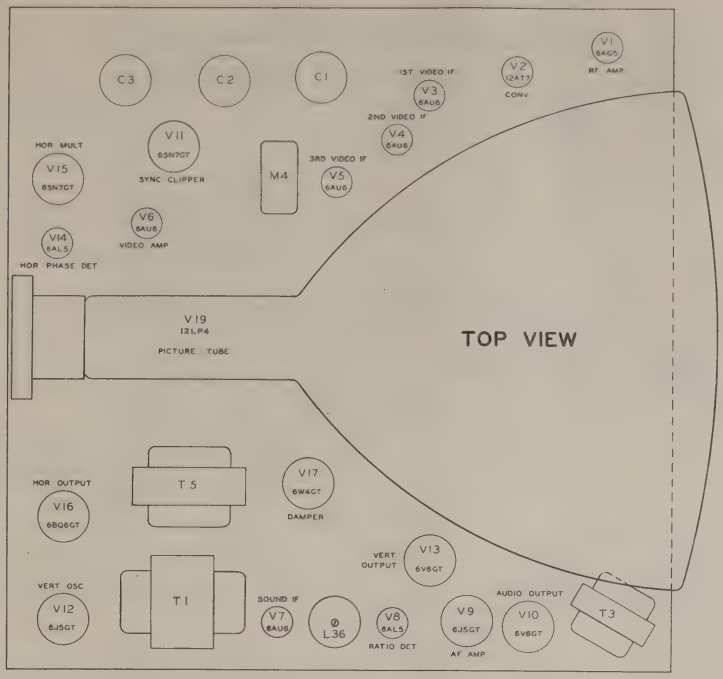
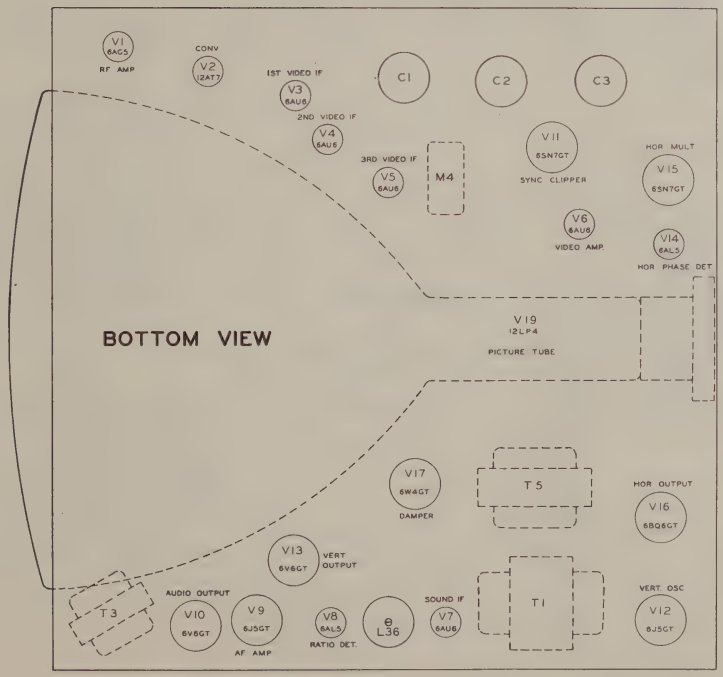




TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V15) from its socket.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	1000MMF	High side to pin 1 (Grid) of 6AU6 (V7). Low side to B-.	4.5MC (Unmod.)	Any channel not used locally	DC Probe thru 10KΩ to Point (A). Common to B-.	A1	Adjust for maximum deflection.
2.	1000MMF	"	"	"	DC Probe thru 10KΩ to Point (B). Common to B-.	A2	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
3.	1000MMF	High side to pin 1 (Grid) of 6AU6 (V6). Low side to B-.	"	"	DC Probe thru 10KΩ to Point (A). Common to B-.	A3	Adjust for maximum deflection.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1000MMF	High side to pin 1 (Grid) of 6AU6 (V6) Low side to B-.	4.5MC (450KC SWP)	4.5MC	Any channel not used locally	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.	A1, A3	Disconnect stabilizer capacitor C5. Adjust for maximum amplitude and symmetry as per Fig 1.
2.	1000MMF	"	"	"	"	Vert. Amp. thru 10KΩ to Point (B). Low side to B-.	A2, A1	Reconnect capacitor C5. Adjust A2 so 4.5MC occurs at center of crossover lines as per Fig 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines. Continue with step 4.

4.5MC TRAP ADJUSTMENT

Conctruct a detector probe as shown in figure 3.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	1000MMF	High side to pin 1 (Grid) of 6AU6 (V6). Low side to B-.	4.5MC (400 ∿ Mod.)	Any channel not used locally	DC Probe thru crystal detector (Fig 3) to pin 11 (cathode) of picture tube (V19). Common to B-.	A4	Adjust for MINIMUM deflection.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery through 4700Ω to the junction of C25 and C26, connect the positive lead to B-.
Unsolder one end of the oscillator cathode choke (L8) to disable the local oscillator.
Set the contrast control to slightly less than maximum clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V3). Low side to AGC line (opposite end of R18).	24.6MC (10MC SWP)	22.9MC 26.3MC	Any	Vert. Amp. to Point (C). Low side to B-.	A5	Adjust for maximum amplitude near 26MC
6.	.01MFD	"	"	"	"	"	A6	Adjust for maximum amplitude near 24.6MC
7.	.01MFD	"	"	"	"	"	A7	Adjust to place 22.9MC marker at 50% on the low frequency side of response curve as shown in Fig 4.
8.	.01MFD	"	"	"	"	"	A5	Adjust to place in Fig 4 marker at 50% on high side of response curve.
9.	.01MFD	High side to pin 2 (Grid) of 12AT7 (V2). Low side to B-.	"	23.1MC 26.1MC	"	"	A8, A9	Turn both cores fully out (counter-clockwise) then turn both in simultaneously until 23.1 MC marker and 26.3MC marker appear at 50% response as shown in Fig 5. If a dip occurs in the response curve, it should not exceed 10%.

OSCILLATOR ALIGNMENT

Set the fine tuning control to the mid-position of its range.
Reconnect the oscillator cathode choke (L8).
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	170.5MC (Unmod.)	10	Vert. Amp. thru 10KΩ to Point (D). Low side to B-.	A10	Adjust for zero beat on scope face as indicated by a narrow trace between two wide traces as the circuit is tuned thru resonance.
11.	"	"	188.15MC 182.15MC 176.15MC 164.15MC 158.15MC 152.15MC	13 12 11 9 8 7	"	L7	Check all high band channels to see if zero beat occurs within 45% of the mid position of the fine tuning control range. If necessary expand or compress the coil turns of L7 to obtain optimum results. If L7 is changed repeat steps 10 and 11
12.	"	"	109.35MC	6	"	A11	Expand or compress coil turns as explained in step 10.
13.	"	"	103.35MC	5	"	A12	"
14.	"	"	93.35MC	4	"	A13	"
15.	"	"	87.35MC	3	"	A14	"
16.	"	"	81.35MC	2	"	A15	"

ALIGNMENT INSTRUCTIONS (CONT.)

ANTENNA AND RF ALIGNMENT

The sweep generator output lead should be terminated with its characteristic impedance usually 50 ohms. Unsolder one end of the oscillator cathode choke (L8).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	195MC (10MC SWP)	193.25MC 197.75MC	10	Vert. Amp. thru 10KΩ to Point ◇. Low side to B-.	A16	Expand or compress coil turns for response curve similar to Fig 6.
18.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"	L5	Check all high band channels for response similar to Fig 6. If necessary expand or compress turns of coil L5 for proper response on channels 11, 12 and 13. If L5 is altered repeat steps 10 and 11.
			207MC (10MC SWP)	205.25MC 209.75MC	12			
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
19.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A17 A18	Expand or compress coil turns for response curve similar to Fig. 7.
			79MC (10MC SWP)	77.25MC 81.75MC	5		A19 A20	Note that the antenna coil affects the position of the video marker and the RF coil affects the position of the sound marker.
			69MC (10MC SWP)	67.25MC 71.75MC	4		A21 A22	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A23 A24	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A25 A26	

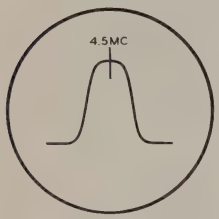


FIG. 1

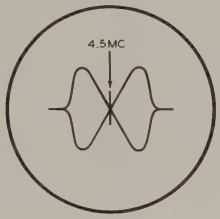


FIG. 2

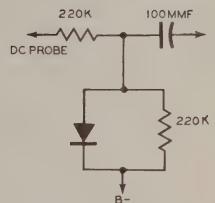


FIG. 3

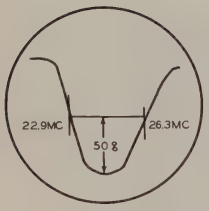


FIG. 4

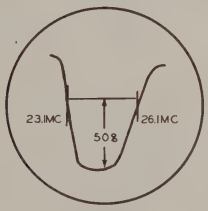


FIG. 5

FIG. 6

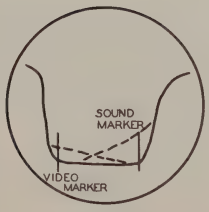


FIG. 7

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.2VDC	1.1VDC	6.3VAC	0V.	182VDC	180VDC	1.1VDC		
V 2	12AT7	185VDC	-6VDC	5.8VDC	0V.	0V.	230VDC	§-7.3VDC	.1VDC	6.3VAC
V 3	6AU6	-.2VDC	.6VDC	0V.	6.3VAC	135VDC	135VDC	.6VDC		
V 4	6AU6	▰-.2VDC	▰.6VDC	#210VDC	#210VDC	▲100VDC	▰100VDC	▰.6VDC		
V 5	6AU6	3.2VDC	4.5VDC	0V.	6.3VAC	187VDC	187VDC	4.5VDC		
V 6	6AU6	0V.	5.4VDC	6.3VAC	0V.	205VDC	220VDC	5.4VDC		
V 7	6AU6	▲0Ω	▲.4Ω	#210VDC	#210VDC	▲33VDC	▲33VDC	▲.4VDC		
V 8	6AL5	.2VDC	-.3VDC	6.3VAC	0V.	0V.	0V.	0V.		
V 9	6J5GT	.1VDC	0V.	42VDC	0V.	0V.	0V.	6.3VAC	2.4VDC	
V 10	6V6GT	0V.	6.3VAC	195VDC	200VDC	0V.	0V.	0V.	10VDC	
V 11	6SN7GT	-2.4VDC	11VDC	0V.	10VDC	165VDC	16VDC	6.3VAC	0V.	
V 12	6J5GT	.1VDC	6.3VAC	25VDC 140VDC	0V.	-17VDC -24VDC	0V.	0V.	0V.	
V 13	6V6GT	0V.	6.3VAC	235VDC	235VDC	0V.	162VDC	0V.	5VDC 32VDC	
V 14	6AL5	0V.	0V.	6.3VAC	0V.	.9VDC	0V.	-4VDC		
V 15	6SN7GT	-1.2VDC -2.4VDC	130VDC	8VDC	0V.	215VDC	7.6VDC	6.3VAC	0V.	
V 16	6BQ6GT	0V.	0V.	0V.	140VDC	-13VDC	130VDC	6.3VAC	5.1VDC	TOP CAP *
V 17	6W4GT	0V.	0V.	270VDC	60VDC	45VDC	0V.	270VDC	270VDC	
V 18	1B3GT	* DO NOT MEASURE.								
V 19	12LP4	6.3VAC	0V.	PIN 10 270VDC	PIN 11 160VDC	PIN 12 0V.				

§ TAKEN WITH VACUUM TUBE VOLTMETER.
# 6.3 VAC MEASURED ACROSS FILAMENTS.
▲ MEASURED FROM PIN 4 OF V4.
▰ MEASURED FROM PIN 6 OF V3.

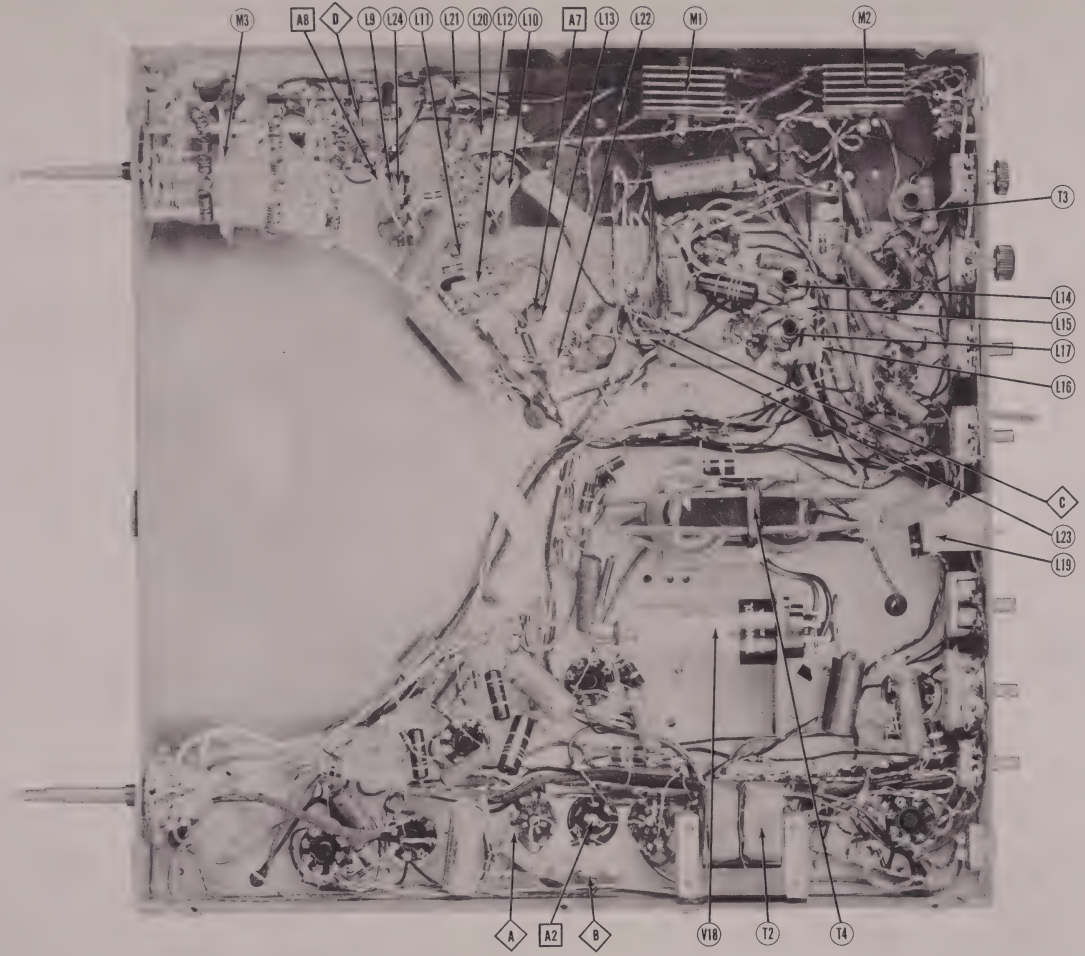
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	2.5 Meg.	82Ω	.1Ω	0Ω	†4.5KΩ	†4KΩ	82Ω		
V 2	12AT7	†3KΩ	33KΩ	1.2KΩ	0Ω	0Ω	†1000Ω	10KΩ	3.5Ω	.1Ω
V 3	6AU6	2.5 Meg.	82Ω	0Ω	.1Ω	▰.2Ω	▰0Ω	82Ω		
V 4	6AU6	2 Meg.	▰82Ω	▲.1Ω	▲0Ω	†280Ω	†280Ω	▰82Ω		
V 5	6AU6	220Ω	300Ω	0Ω	.1Ω	†2KΩ	†2KΩ	300Ω		
V 6	6AU6	1 Meg.	1000Ω	.1Ω	0Ω	†12KΩ	†5KΩ	1000Ω		
V 7	6AU6	▲1000Ω	▲1.2KΩ	▲0Ω	▲.1Ω	†1.1KΩ	†1.1KΩ	▲1.2KΩ		
V 8	6AL5	6.8KΩ	6.8KΩ	.1Ω	0Ω	1 Meg.	0Ω	1 Meg.		
V 9	6J5GT	470KΩ	0Ω	†470KΩ	Inf.	13Ω	Inf.	.1Ω	1000Ω	
V 10	6V6GT	Inf.	.1Ω	†1.5KΩ	†1.1KΩ	470KΩ	0Ω	0Ω	330Ω	
V 11	6SN7GT	1 Meg.	†1 Meg.	0Ω	24KΩ	†7.6KΩ	3.2KΩ	.1Ω	0Ω	
V 12	6J5GT	470KΩ	.1Ω	†5.5Meg. †500KΩ	Inf.	1.6Meg. 680KΩ	Inf.	0Ω	0Ω	
V 13	6V6GT	130KΩ	.1Ω	†800Ω	†800Ω	10 Meg.	†36KΩ	0Ω	5.5KΩ 470Ω	
V 14	6AL5	15KΩ	15KΩ	.1Ω	0Ω	4.8 Meg.	0Ω	4.8 Meg.		
V 15	6SN7GT	200KΩ 100KΩ	†150KΩ	1.5KΩ	9.5 Meg.	†7KΩ	1000Ω	.1Ω	0Ω	
V 16	6BQ6GT	Inf.	0Ω	Inf.	†6.8KΩ	470KΩ	1.2 Meg.	.1Ω	47Ω	TOP CAP †130Ω
V 17	6W4GT	Inf.	Inf.	†130Ω	†5KΩ	†5.5KΩ	Inf.	†130Ω	†130Ω	
V 18	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP †300Ω
V 19	12LP4	.1Ω	0Ω	PIN 10 †100Ω	PIN 11 300KΩ 50KΩ	PIN 12 0Ω				

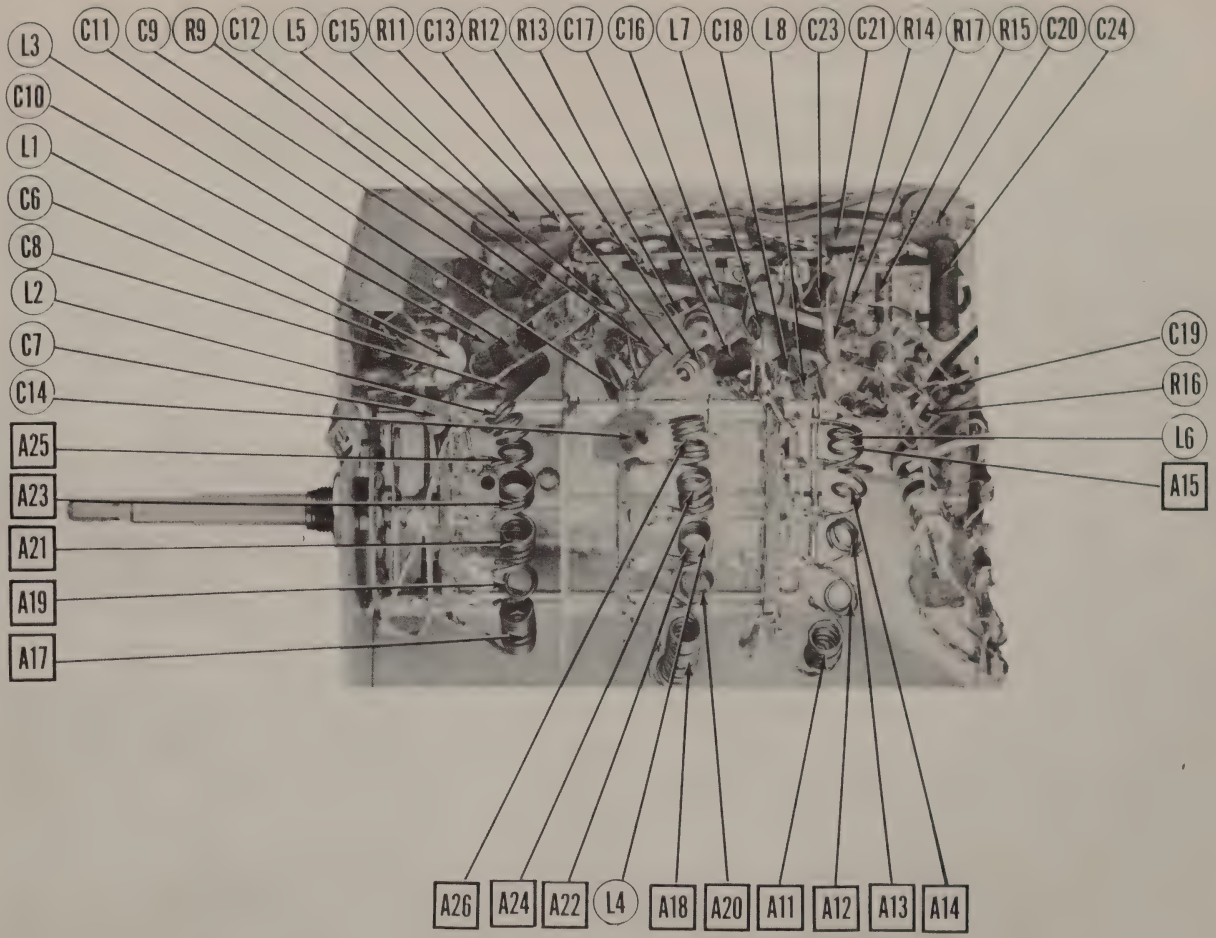
† MEASURED FROM OUTPUT OF M1.
▰ MEASURED FROM PIN 6 OF V3.
▲ MEASURED FROM PIN #4 OF V4

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

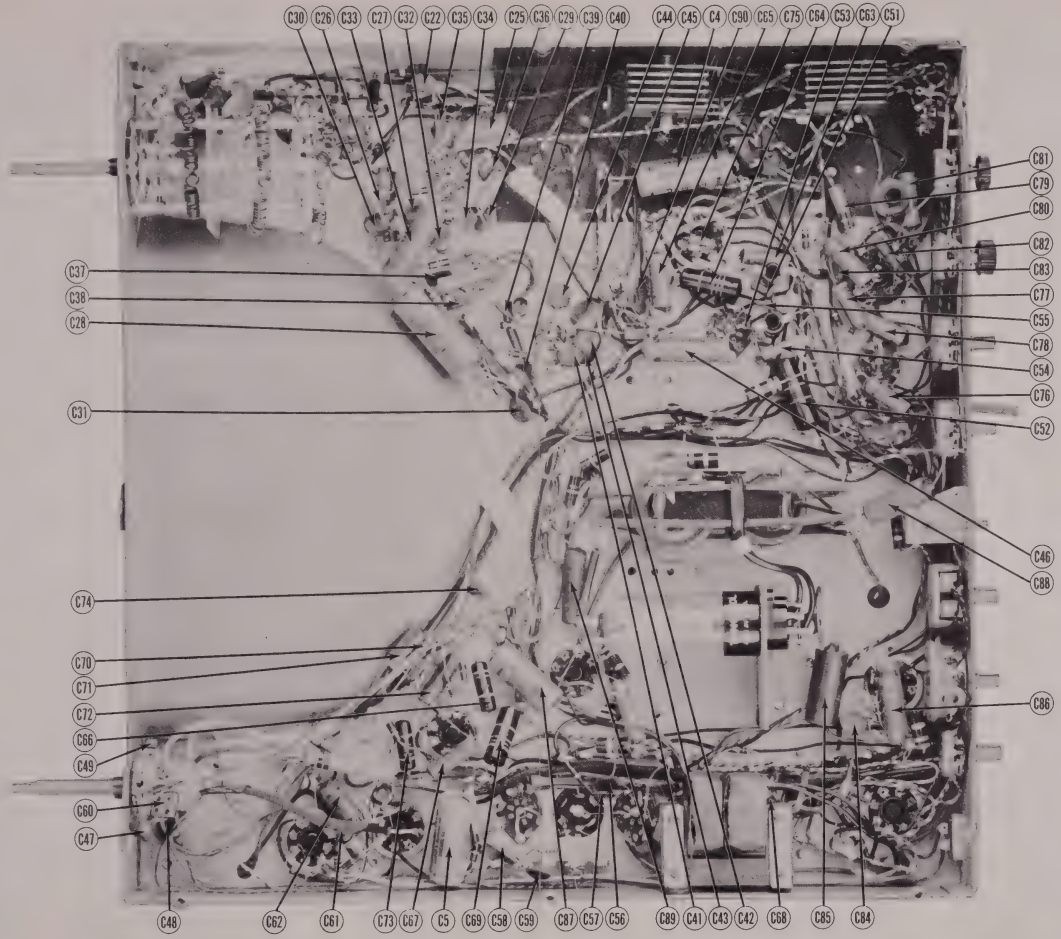
CHASSIS TOP VIEW



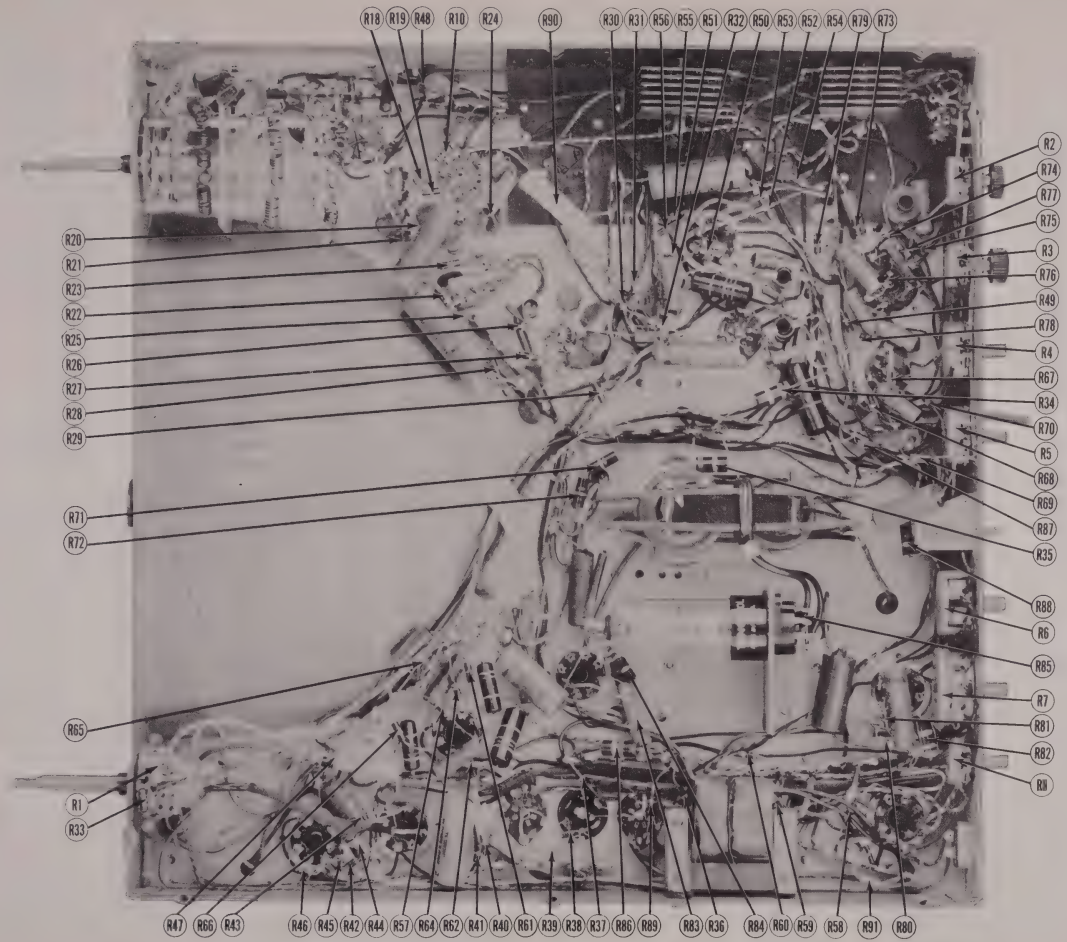
CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION


C11
C9
R9
C12
L5
C15
R11
C13
R12
R13
C17
C16
L7
C18
L8
C23
C21
R14
R17
R15
C20
C24
L3
C10
L1
C6
C8
L2
C7
C14
A25
A23
A21
A19
A17
C19
R16
L6
A15
A26
A24
A22
L4
A18
A20
A11
A12
A13
A14

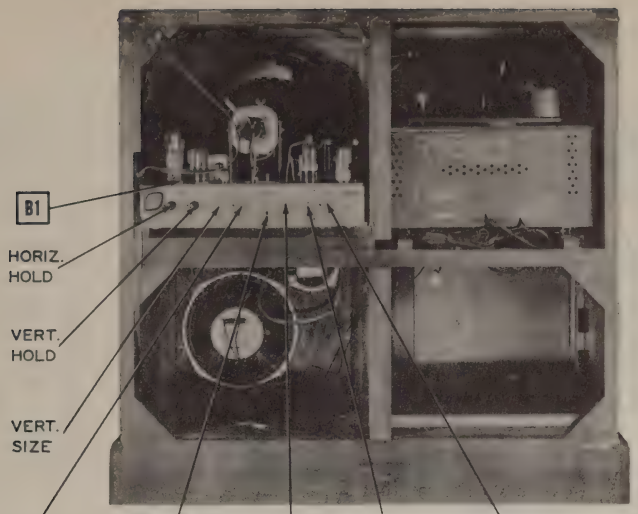
RF TUNER



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CABINET-REAR VIEW

HORIZONTAL FREQENCY AND LINEARITY ADJUSTMENTS

Turn the set on and tune in a TV station. Turn the horizontal hold control to the mid-position of its range. Adjust the horizontal frequency slug (B1) to the center of the range over which the picture synchronizes horizontally.

Adjust the horizontal size lever (B2) until the picture fills the mask horizontally. Adjust the horizontal linearity control until picture is symmetrical from left to right.

DISASSEMBLY INSTRUCTIONS (MODEL 12VF4R)

1. Remove six push-on type control knobs from TV and radio.
2. Remove twelve screws holding rear cover of radio section. Remove cover.
3. Remove ten screws holding rear cover of TV section. Disconnect TV power plug and remove cover.
4. Loosen antenna terminal screws. Remove built-in antenna leads.
5. Remove two screws holding antenna terminal strip.
6. Remove speaker plug.
7. Remove six 1/4" hex head bolts holding TV chassis. Remove chassis.
8. Remove two screws holding AM loop antenna. (Receiver rear cover.) Pull out and remove antenna plugs. Remove cover.
9. Disconnect phono motor power plug and pick-up plug.
10. Remove speaker plugs.
11. Remove two screws holding power interlock plug.
12. Remove phillips head screw holding phono motor power plug clamp. Remove clamp.
13. Remove three 1/4" hex head bolts holding AM-FM chassis. Remove chassis. (It is necessary to turn chassis to various positions for removal.)

DISASSEMBLY INSTRUCTIONS (MODEL 10VK22)

1. Remove two push-on type control knobs.
2. Remove eight screws holding rear cover. Remove cover.
3. Remove speaker plug.
4. Loosen two antenna terminal screws. Remove built-in antenna.
5. Remove two screws holding antenna terminal strip.
6. Remove five 1/4" hex head bolts holding chassis. Remove chassis.
7. Remove four 5/16" hex nuts holding speaker. Remove speaker.

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.		6AG5	6AG5	7BD
V2	Converter		12AT7	12AT7	9A
V3	1st Video IF		6AU6	6AU6	7BK
V4	2nd Video IF		6AU6	6AU6	7BK
V5	3rd Video IF		6AU6	6AU6	7BK
V6	Video Amp.		6AU6	6AU6	7BK
V7	Sound IF Amp.		6AU6	6AU6	7BK
V8	Ratio Det.		6AL5	6AL5	6BT
V9	AF Amp.		6J5GT	6J5GT	6Q
V10	Audio Output		6V6GT	6V6GT	7AC
V11	Sync. Clipper		6SN7GT	6SN7GT	8BD
V12	Vert. Osc.		6J5GT	6J5GT	6Q
V13	Vert. Output		6V6GT	6V6GT	7AC
V14	Hor. Phase Det.		6AL5	6AL5	6BT
V15	Hor. Multivibrator		6SN7GT	6SN7GT	8BD
V16	Hor. Output		6BQ6GT	6BQ6GT	6AM
V17	Damper		6W4GT	6W4GT	4CG
V18	HV Rectifier		1B3GT	1B3GT	3C
V19A	Picture Tube		12LP4	12LP4	12D
B	Picture Tube		10BP4	10BP4	12D

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	140	150	23B484097	AFH28D		D6282	Voltage Doubler Cap.
C2A	100	300	23B790147	AFH20G124F		D14986	▲ Filter
B	60	250					■ Filter
C	20	250					▲ Decoupling
C3A	125	300	23B790148	AFH24G4F5A		D7205	▲ Filter
B	20	250		20B			■ V. Amp. Decoupling
C	20	25					▲ Output Cathode Bypass
D	100	15					Not used
C4	100	30		PRS50/100		TVA-17	Vert. Output Cathode Bypass
C5	10	50	23A90205	PRS50/10		TVA-14	Stabilizing Cap.
C6	250		21K77375	GP250M	GP2K-250		Ant. Isolation
C7	50		21K77373	GP50M	GP1K-50		RF Coupling
C8	250		21K77375	GP250M	GP2K-250		RF Coupling
C9	10000		21K482726	BPD-10	821-01	36C1	AVC Filter
C10	1500		21A470790	GP1500M	GP2L-0015	29C3	RF Cathode Bypass ♦
C11	1500		21A470790	GP1500M	GP2L-0015	29C3	RF Cathode Bypass ♦
C12	1500		21A470790	GP1500M	GP2L-0015	29C3	RF Screen Bypass ♦
C13	10000		21K482726	BPD-10	821-01	36C1	RF Plate Decoupling
C14	10000		21K482726	BPD-10	821-01	36C1	RF Plate Decoupling
C15	250		21K77375	GP250M	GP2K-250		RF Filament Bypass
C16	6		21K470324				RF Coupling
C17	2		21K478280				Osc. Coupling
C18	20		21K470322	CN20JNP0	NP0K-20		Osc. Grid Cap.
C19	2		21K478280				Osc. Feedback
C20	1500		21A470790	GP1500M	GP2L-0015	29C3	Osc. Plate Bypass ♦
C21	5000		21A470789	BPD-5	811-005	29C1	RF Bypass
C22	1500		21A470790	GP1500M	GP2L-0015	29C3	Mixer Plate Decoupling
C23	1500		21A470790	GP1500M	GP2L-0015	29C3	Mixer Cathode Bypass
C24	250		21K77375	GP250M	GP2K-250		Mixer Filament Bypass
C25	.25	100	8R9810	P288-25			AGC Filter
C26	1500		21A470790	GP1500M	GP2L-0015	29C3	AGC Filter
C27	5000		21A470789	BPD-5	811-005	29C1	1st V. IF Cathode Bypass
C28	.5	200	8R9822	P288-5		TC-5	1st V. IF Decoupling
C29	5000		21A470789	BPD-5	811-005	29C1	1st V. IF Decoupling
C30	5000		21A470789	BPD-5	811-005	29C1	RF Bypass
C31	5000		21A470789	BPD-5	811-005	29C1	RF Bypass
C32	5000		21A470789	BPD-5	811-005	29C1	AGC Filter ¶
C33	.1	200	8R9806	P288-1		TM-1	AGC Filter
C34	1500		21A470790	GP1500M	GP2L-0015	29C3	IF Coupling
C35	250		21K77375	GP250M	GP2K-250	1FM-325	1st V. IF Fil. Bypass
C36	5000		21A470789	BPD-5	811-005	29C1	RF Bypass
C37	1500		21A470790	GP1500M	GP2L-0015	29C3	2nd V. IF Cath. Bypass ♦
C38	1500		21A470790	GP1500M	GP2L-0015	29C3	2nd V. IF Decoupling ♦
C39	1500		21A470790	GP1500M	GP2L-0015	29C3	IF Coupling
C40	1500		21A470790	GP1500M	GP2L-0015	29C3	AGC Filter
C41	5000		21A470789	BPD-5	811-005	29C1	3rd V. IF Cath. Bypass
C42	5000		21A470789	BPD-5	811-005	29C1	3rd V. IF Decoupling
C43	5000		21A470789	BPD-5	811-005	29C1	3rd V. IF Decoupling
C44	1500		21A470790	GP1500M	GP2L-0015	29C3	3rd V. IF Fil. Bypass
C45	1500		21A470790	GP1500M	GP2L-0015	29C3	3rd V. IF Fil. Bypass
C46	.1	100	8R9806	P288-1		TM-1	Video Coupling
C47	1000		21K478410	GP1000M	GP2L-001	1FM-21	V. Amp. Cathode Bypass
C48	750		21K780598	GP750M	GP2K-750	1FM-375	V. Amp. Cathode Bypass
C49	250		21K77375	GP250M	GP2K-250	1FM-325	V. Amp. Cathode Bypass
C50	5000		21A470789	BPD-5	811-005	29C1	V. Amp. Decoupling #
C51	70		21K470328			MS-47	Fixed Trimmer
C52	.1	400	8R9874	P488-1		TM-1	Video Coupling
C53	2		21K478280				Sound IF Coupling
C54	60		21K790683			MS-46	Fixed Trimmer
C55	1500		21A470790	GP1500M	GP2L-0015	29C3	Sound IF Decoupling ♦
C56	5000		21A470789	BPD-5	811-005	29C1	Sound IF Cathode Bypass
C57	5000		21A470789	BPD-5	811-005	29C1	Sound IF Decoupling
C58	500	500	21R6590	1468-0005	GP2K-500	1FM-35	Diode Load Cap.
C59	1500		21A470790	GP1500M	GP2L-0015	29C3	De-emphasis
C60	500	500	21R6590	1468-0005	GP2K-500	1FM-35	AF Grid Bypass
C61	5000		21A470789	BPD-5	811-005	29C1	Audio Coupling
C62.	.01	600	8R9834	P688-01	GP2-335-01	TM-11	Output Plate Decoupling
C63	.001	600	8R9866	P688-001	GP2L-001	TM-21	Sync. Coupling
C64	.047	400	8R9873	P488-047		TM-15	Sync. Coupling
C65	.005	600	21A470789	P688-005	GP2M-005	TM-25	Integrator Net.
C66	.0047	600	21A470789	P688-0047	GP2M-005	TM-25	Integrator Net.
C67	.002	600	8R9867	P688-002	GP2M-002	TM-22	Vert. Sync. Coupling

PARTS LIST AN

CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT: MOTOROLA PART No.	REPLACEMENT: AEROVOX PART No.	REPLACEMENT: PAR
C68	.05	600	8R9873	P688-05	
C69	.047	400	8R9873	P488-047	
C70	.0047	600	8R9869	P688-0047	GP2M
C71	.001	600	8R9866	P688-001	GP2L
C72	.002	600	8R9867	P688-002	GP2M
C73	.0047	600	8R9869	P688-0047	GP2M
C74	1500		21A470790	GP1500M	GP2L
C75	20		21K470322	GP20K	NP0K
C76	.001	600	21K470790	P688-001	GP2L
C77	.001	600	21K470790	P688-001	GP2L
C78	.005	600	8R8970	P688-005	GP2M
C79	.001	600	8R9866	P688-001	GP2L
C80	.01	600	8R9870	P688-01	GP2-
C81	.005	600	8R9869	P688-005	GP2M
C82	250		21K77375	GP250M	GP2K
C83	680	500	21R2741	GP680K	GP2K
C84	5000		21A470789	BPD-5	811-00
C85	.1	600	8R9874	P688-1	
C86	.1	100	8R9806	P288-1	
C87	.1	600	8R9874	P688-1	
C88	.05	600	8R9819	P688-05	
C89	.02	600	8R9872	P688-02	
C90	5000		21A470789	1467-005	811-00

♦ Some models use 5000MMF in this application.
¶ Some models use 1500MMF in this application.
# Not used in all models.

CO

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAR PAR
R1A	2000Ω		18A790166		
B	1 Meg.				
R2	100KΩ		18A791574	Q11-128	M-49-
R3	1 Meg.		18A90147	Q11-137	M-61-
R4	5 Meg.		18A90145	Q11-141	M-85-
R5	5000Ω		18A791132	Q11-114	M-19-
R6	2000Ω	2	18A790146	W-2000	43-20
R7	2000Ω	4	18A790162		10-200
R8	1 Meg.		18A90147	Q11-137	M-61-

Note 1. Some models use 50KΩ control, Part No. 18A790

RE

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.
R9	33KΩ		6R6410	BTS-33K
R10	1 Meg. 20%		6R6046	BTS-1 Meg.
R11	82Ω		6R2035	
R12	3900Ω		6R5659	BTS-3900
R13	1000Ω		6R6229	BTS-1000
R14	33KΩ		6R6410	BTS-33K
R15	1200Ω		6R6393	BTS-1200
R16	10KΩ		6R6320	
R17	1000Ω		6R6229	BTS-1000
R18	5600Ω		6R6117	BTS-5600
R19	82Ω		6R2035	
R20	220Ω		6R6270	
R21	4.7 Meg.		6R6446	BTS-4.7 Meg
R22	3.9 Meg.		6R490110	BTS-3.9 Meg
R23	22KΩ		6R6397	
R24	82Ω		6R2035	
R25	220Ω		6R6270	
R26	3900Ω		6R5659	BTS-3900
R27	82Ω		6R2035	
R28	220Ω		6R6270	
R29	220Ω		6R6270	
R30	100KΩ		6R6031	BTS-100K
R31	1.5 Meg.		6R6460	BTS-1.5 Meg
R32	1 Meg. 20%		6R6046	BTS-1 Meg.
R33	180Ω		6R5660	BW-½-180
R34	6800Ω	2	6R5690	BT-2-6800
R35	4700Ω	2	6R5671	BT-2-4700
R36	150Ω		6R6373	
R37	1000Ω		6R6229	BTS-1000
R38	220Ω		6R6270	
R39	33KΩ		6R6410	BTS-33K
R40	6800Ω		6R6428	BTS-6800
R41	6800Ω		6R6428	BTS-6800
R42	1000Ω		6R6229	BTS-1000
R43	470KΩ		6R6377	BTS-470K
R44	100KΩ	1	6R6328	BTA-100K
R45	470KΩ		6R6377	BTS-470K
R46	330Ω			BW-½-330
R47	1000Ω	2	6R3922	BT-2-1000
R48	1000Ω		6R6229	BTS-1000
R49	10KΩ		6R6320	BTS-10K
R50	1 Meg. 20%		6R6046	BTS-1 Meg.
R51	1 Meg. 20%		6R6046	BTS-1 Meg.
R52	22KΩ		6R6397	BTS-22K
R53	1000Ω		6R6229	BTS-1000
R54	2200Ω		6R6069	BTS-2200
R55	5600Ω		6R6117	BTS-5600
R56	22KΩ		6R6397	BTS-22K
R57	8200Ω		6R2004	BTS-8200
R58	680KΩ			BTS-680K
R59	470KΩ		6R6377	BTS-470K

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6AG5	6AG5	7BD	
V2	Converter	12AT7	12AT7	9A	
V3	1st Video IF	6AU6	6AU6	7BK	
V4	2nd Video IF	6AU6	6AU6	7BK	
V5	3rd Video IF	6AU6	6AU6	7BK	
V6	Video Amp.	6AU6	6AU6	7BK	
V7	Sound IF Amp.	6AU6	6AU6	7BK	
V8	Ratio Det.	6AL5	6AL5	6BT	
V9	AF Amp.	6J5GT	6J5GT	6Q	
V10	Audio Output	6V6GT	6V6GT	7AC	
V11	Sync. Clipper	6SN7GT	6SN7GT	8BD	
V12	Vert. Osc.	6J5GT	6J5GT	6Q	
V13	Vert. Output	6V6GT	6V6GT	7AC	
V14	Hor. Phase Det.	6AL5	6AL5	6BT	
V15	Hor. Multivibrator	6SN7GT	6SN7GT	8BD	
V16	Hor. Output	6BQ6GT	6BQ6GT	6AM	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1B3GT	1B3GT	3C	
V18A	Picture Tube	12LP4	12LP4	12D	
B	Picture Tube	10BP4	10BP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	140	150	23D484097	AFH28D		D6383	Voltage Doubler Cap.
C2A	100	300	23D790247	AFE30G334F		D14886	★ Filter
B	60	250					★ Filter
C	20	250					★ Decoupling
C3A	125	300	23D790148	AFH34G4F5A		D7205	★ Filter
B	20	250		20B			★ V. Amp. Decoupling
C	20	25					★ Output Cathode Bypass
D	100	15					Not used
C4	100	30		PRS50/100		TVA-17	Vert. Output Cathode Bypass
C5	10	50	23A90305	PRS50/10		TVA-14	Stabilizing Cap.
C6	350		21K77375	GP250M	GP2K-250		Ant. Isolation
C7	50		21K77373	GP50M	GP1K-50		RF Coupling
C8	250		21K77375	GP250M	GP2K-250		RF Coupling
C9	.10000		21K482736	BPD-10	831-01	36C1	AVC Filter
C10	1500		21A470790	GP1500M	GP2L-0015	29C3	RF Cathode Bypass ★
C11	1500		21A470790	GP1500M	GP2L-0015	29C3	RF Cathode Bypass ★
C12	1500		21A470790	GP1500M	GP2L-0015	29C3	RF Screen Bypass ★
C13	10000		21K483726	BPD-10	831-01	36C1	RF Plate Decoupling
C14	10000		21K482726	BPD-10	831-01	36C1	RF Plate Decoupling
C15	350		21K77375	GP250M	GP2K-350		RF Filament Bypass
C16	6		21K470324				RF Coupling
C17	2		21K478280				Osc. Coupling
C18	20		21K470323	CN20JNPO	NPOK-30		Osc. Grid Cap.
C19	2		21K478280				Osc. Feedback
C20	1500		21A470790	GP1500M	GP2L-0015	29C3	Osc. Plate Bypass ★
C21	5000		21A470789	BPD-5	811-005	29C1	RF Bypass
C22	1500		21A470790	GP1500M	GP2L-0015	29C3	Mixer Plate Decoupling
C23	1500		21A470790	GP1500M	GP2L-0015	29C3	Mixer Cathode Bypass
C24	250		21K77375	GP250M	GP2K-250		Mixer Filament Bypass
C25	.25	100	23R9810	P288-25			AGC Filter
C26	1500		21A470790	GP1500M	GP2L-0015	29C3	AGC Filter
C27	5000		21A470789	BPD-5	811-005	29C1	1st V. IF Cathode Bypass
C28	5	200	23R9823	P288-5		TC-5	1st V. IF Decoupling
C29	5000		21A470789	BPD-5	811-005	29C1	1st V. IF Decoupling
C30	5000		21A470789	BPD-5	811-005	29C1	RF Bypass
C31	5000		21A470789	BPD-5	811-005	29C1	RF Bypass
C32	5000		21A470789	BPD-5	811-005	29C1	AGC Filter ¶
C33	.1	200	23R9806	P288-1		TM-1	AGC Filter
C34	1500		21A470790	GP1500M	GP2L-0015	29C3	IF Coupling
C35	250		21K77375	GP250M	GP2K-250	1FM-325	1st V. IF Fil. Bypass
C36	5000		21A470789	BPD-5	811-005	29C1	2nd V. IF Cath. Bypass ★
C37	1500		21A470790	GP1500M	GP2L-0015	29C3	2nd V. IF Cath. Bypass ★
C38	1500		21A470790	GP1500M	GP2L-0015	29C3	2nd V. IF Decoupling ★
C39	1500		21A470790	GP1500M	GP2L-0015	29C3	IF Coupling
C40	1500		21A470790	GP1500M	GP2L-0015	29C3	AGC Filter
C41	5000		21A470789	BPD-5	811-005	29C1	3rd V. IF Cath. Bypass
C42	5000		21A470789	BPD-5	811-005	29C1	3rd V. IF Decoupling
C43	5000		21A470789	BPD-5	811-005	29C1	3rd V. IF Decoupling
C44	1500		21A470790	GP1500M	GP2L-0015	29C3	3rd V. IF Fil. Bypass
C45	1500		21A470790	GP1500M	GP2L-0015	29C3	3rd V. IF Fil. Bypass
C46	.1	100	23R9806	P288-1		TM-1	Video Coupling
C47	1000		21K478410	GP1000M	GP2L-001	1FM-21	V. Amp. Cathode Bypass
C48	750		21K780596	GP750M	GP2K-750	1FM-375	V. Amp. Cathode Bypass
C49	250		21K77375	GP250M	GP2K-350	1FM-325	V. Amp. Cathode Bypass
C50	5000		21A470789	BPD-5	811-005	29C1	V. Amp. Decoupling ★
C51	70		21K470328			MS-47	Fixed Trimmer
C52	.1	400	21R9874	P488-1		TM-1	Video Coupling
C53	2		21K478280				Sound IF Coupling
C54	90		21K790663			MS-46	Fixed Trimmer
C55	1500		21A470790	GP1500M	GP2L-0015	29C3	Sound IF Decoupling ★
C56	5000		21A470789	BPD-5	811-005	29C1	Sound IF Cathode Bypass
C57	5000		21A470789	BPD-5	811-005	29C1	Sound IF Decoupling
C58	500	500	21R6590	1468-0005	GP2K-500	1FM-35	Diode Load Cap.
C59	1500		21A470790	GP1500M	GP2L-0015	29C3	De-emphasis
C60	500	500	21R6590	1468-0005	GP2K-500	1FM-35	AF Grid Bypass
C61	5000		21A470789	BPD-5	811-005	29C1	Audio Coupling
C62	.01	600	21R9834	P688-01	GP2J-335-01	TM-11	Output Plate Decoupling
C63	.001	600	21R9866	P688-001	GP2L-001	TM-31	Sync. Coupling
C64	.047	400	21R9873	P488-047		TM-15	Sync. Coupling
C65	.005	600	21A470789	P688-005		GP2M-005	TM-25 Integrator Net.
C66	.0047	600	21A470789	P688-0047		GP2M-005	TM-25 Integrator Net.
C67	.002	600	21R9867	P688-002		GP2M-002	TM-22 Vert. Sync. Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C68	.05	600	8R9873	P688-05		TM-15	Vert. Discharge
C69	.047	600	8R9873	P688-047		TM-15	Vert. Sweep Coupling
C70	.0047	600	8R9869	P688-0047	GP2M-005	TM-25	Vert. Sweep Coupling
C71	.001	600	8R9866	P688-001	GP2L-001	TM-31	Voltage Divider
C72	.002	600	8R9867	P688-002	GP2M-002	TM-22	Integrator Net.
C73	.0047	600	8R9869	P688-0047	GP2M-005	TM-25	Vert. MV Feedback
C74	1500		21A470790	GP1500M	GP2L-0015	29C3	RF Bypass
C75	20		21K470322	GP20K		MS-42	1st Sync. Clipper Grid Bypass #
C76	.001	600	21K470790	P688-001	GP2L-001	TM-21	Hor. Sync. Coupling ¶
C77	.001	600	21K470790	P688-001	GP2L-001	TM-21	Hor. Sync. Coupling ¶
C78	.005	600	8R8970	P688-005	GP2M-005	TM-25	AFC Filter
C79	.001	600	8R8966	P688-001	GP2L-001	TM-21	AFC Filter
C80	.001	600	8R8970	P688-01	GP2-335-01	TM-11	AFC Filter
C81	.005	600	8R9869	P688-005	GP2M-005	TM-25	Fixed Trimmer
C82	250		21K77375	GP250M	GP2K-350	1FM-325	Hor. MV Feedback
C83	680	500	21R2741	GP68QK	GP2K-680	1FM-37	Hor. Discharge
C84	5000		21A470789	BPD-5	811-005	29C1	Hor. Sweep Coupling
C85	.1	600	8R9874	P688-1		TM-1	Hor. Output Screen Bypass
C86	.1	100	8R9806	P288-1		TM-1	Hor. Output Cathode Bypass
C87	.1	600	8R9874	P688-1		TM-1	Damper Filter
C88	.05	600	8R9819	P688-05		TM-15	Linearity Cap.
C89	.02	600	8R9872	P688-02		TM-12	Hor. Sweep Coupling
C90	.9000	1	21A470789	1467-005	811-005	29C1	RF Bypass #

★ Some models use 5000MMF in this application.
¶ Some models use 1500MMF in this application.
# Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	2000Ω	1	18A790166			Contrast control, tapped at 1000Ω and 1500Ω
B	1 Meg.	1				Volume control and switch
R2	100KΩ	1	18A791574	QII-128	M-49-S	Horiz. hold control-See note 1
R3	1 Meg.	1	18A90147	QII-137	M-61-S	Vert. hold control
R4	5 Meg.	1	18A90145	QII-141	M-63-S	Height control
R5	5000Ω	1	18A791132	QII-114	M-19-S	Vert. linearity control
R6	2000Ω	2	18A790148	W-2000	43-2000	Horiz. linearity control-Wire Wound
R7	3000Ω	4	18A790162		10-2000	Focus control, Wire Wound
R8	1 Meg.	1	18A90147	QII-137	M-61-S	Brightness control

Note 1. Some models use 50KΩ control, Part No. 18A790167, in this application.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
					ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R9	33KΩ	1	6R6410	BTS-33K	RF Choke Shunt
R10	1 Meg. 20%	1	6R6546	BTS-1 Meg.	Bias Network
R11	82Ω	1	6R2035		RF Cathode
R12	3900Ω	1	6R5659	BTS-3900	RF Plate Decoupling
R13	1000Ω	1	6R6229	BTS-1000	RF Screen Decoupling
R14	33KΩ	1	6R6410	BTS-33K	Conv. Grid
R15	1200Ω	1	6R6393	BTS-1200	Conv. Cathode
R16	10KΩ	1	6R6320		Osc. Grid
R17	1000Ω	1	6R6229	BTS-1000	Osc. Plate Decoupling
R18	5600Ω	1	6R6117	BTS-5600	1st Video IF Transformer Shunt
R19	82Ω	1	6R2035		1st Video IF Cathode
R20	220Ω	1	6R6370		1st Video IF Decoupling
R21	4.7 Meg.	1	6R6446	BTS-4.7 Meg.	Voltage Divider
R22	3.9 Meg.	1	5R490110	BTS-3.9 Meg.	Voltage Divider
R23	22KΩ	1	6R6397		2nd Video IF Grid
R24	82Ω	1	6R2035		2nd Video IF Cathode
R25	220Ω	1	6R6370		2nd Video IF Decoupling
R26	3900Ω	1	6R5659	BTS-3900	3rd Video IF Coil Shunt
R27	82Ω	1	6R2035		3rd Video IF Cathode
R28	220Ω	1	6R6370		3rd Video IF Decoupling
R29	220Ω	1	6R6370		3rd Video IF Decoupling
R30	100KΩ	1	6R6421	BTS-100K	Voltage Divider
R31	1.5 Meg.	1	6R6460	BTS-1.5 Meg.	Bias Network
R32	1 Meg. 20%	1	6R6546	BTS-1 Meg.	Video Amp. Grid
R33	180Ω	2	6R5960	BW-180	Voltage Divider
R34	6800Ω	2	6R5690	BT-2-6800	Video Amp. Plate
R35	4700Ω	2	6R5671	BT-2-4700	Video Amp. Decoupling
R36	150Ω	1	6R6373		Sound IF Cathode
R37	1000Ω	1	6R6229	BTS-1000	Sound IF Decoupling
R38	220Ω	1	6R6370		Balancing
R39	33KΩ	1	6R6410	BTS-33K	De-emphasis
R40	6800Ω	1	6R6428	BTS-6800	Ratio Det. Diode Load
R41	6800Ω	1	6R6428	BTS-6800	Ratio Det. Diode Load
R42	1000Ω	1	6R6229	BTS-1000	AF Cathode
R43	470KΩ	1	6R6377	BTS-470K	AF Plate
R44	100KΩ	1	6R6328	BTA-100K	Voltage Divider-See Note 6
R45	470KΩ	1	6R6377	BTS-470K	Output Grid
R46	330Ω	2		BW-1-330	Output Cathode-See Note 3
R47	1000Ω	2	6R3922	BT-2-1000	Decoupling
R48	1000Ω	1	6R6229	BTS-1000	Decoupling
R49	10KΩ	1	6R6330	BTS-10K	Isolation
R50	1 Meg. 20%	1	6R6546	BTS-1 Meg.	Sync. Clipper Grid
R51	1 Meg. 20%	1	6R6546	BTS-1 Meg.	Sync. Clipper Plate
R52	22KΩ	1	6R6397	BTS-22K	Sync. Clipper Grid
R53	1000Ω	1	6R6229	BTS-1000	Sync. Clipper Cathode
R54	2200Ω	1	6R6089	BTS-2200	Sync. Clipper Cathode
R55	5600Ω	1	6R6117	BTS-5600	Sync. Clipper Plate
R56	22KΩ	1	6R6397	BTS-22K	Integrator
R57	820KΩ	1	6R3004	BTS-820K	Integrator
R58	680KΩ	1		BTS-680K	Vert. Osc. Grid
R59	470KΩ	1	6R6377	BTS-470K	Vert. Osc. Plate

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R60	82000Ω	1	6R3004	BTS-8200	Vert. Peaking
R61	10 Meg. 20%	1		BTS-10 Meg.	Vert. Output Grid-See Note 3
R62	470Ω	1	6R6090	BTS-470	Vert. Output Cathode
R63	150KΩ	1	6R6398	BTS-150K	Voltage Divider-See Note 4
R64	100KΩ	1	6R6031	BTS-100K	Voltage Divider
R65	100KΩ	1	6R6031	BTS-100K	Voltage Divider
R66	22KΩ	1	6R6397	BTS-22K	Integrator Network
R67	100KΩ	1	6R6031	BTS-100K	Horiz. Phase Det. Load
R68	100KΩ	1	6R6031	BTS-100K	Horiz. Phase Det. Load
R69	4.7 Meg.	1	6R6446	BTS-4.7 Meg.	Feedback Network
R70	15KΩ	1	6R6477	BTS-15K	Feedback Network
R71	150KΩ 5%	1	6R5721	BTA-150K-5%	Feedback Network
R72	150KΩ 5%	1	6R5721	BTA-150K-5%	Feedback Network
R73	4.7 Meg.	1	6R6446	BTS-4.7 Meg.	Horiz. AFC Filter Network
R74	68000Ω	1	6R6428	BTS-6800	Horiz. MV Plate
R75	1000Ω	1	6R6229	BTS-1000	Horiz. MV Cathode
R76	470Ω	1	6R6090	BTS-470	Horiz. MV Cathode
R77	100KΩ	1	6R6031	BTS-100K	Horiz. MV Grid
R78	120KΩ	1		BTS-120K	Horiz. MV Plate-See Note 5
R79	1500Ω	1	6R6038	BTS-1500	Horiz. Peaking
R80	470KΩ	1	6R6377	BTS-470K	Horiz. Output Grid
R81	47Ω	1	6R5550	BW-1-47	Horiz. Output Cathode
R82	6800Ω	2	6R5690	BT-2-6800	Horiz. Output Screen
R83	1000Ω	2	6R3922	BT-2-1000	Damper Filter
R84	470Ω	1		BTA-470	Damper Filter-See Note 4
R85	3.3Ω	1	17K485412		HV Rect. Filament
R86	10KΩ	2	6R6299	BT-2-10K	Focus Coil Shunt
R87	47KΩ	1	6R6048	BTS-47K	Voltage Divider
R88	10KΩ	1	6R6320	BTA-10K	Horiz. Size Coil Shunt
R89	1000Ω	1	6R6229	BTS-1000	Voltage Equalizer
R90	7.5Ω	3	17A79166		Surge Limiter-Wire Wound
R91	470KΩ	1	6R6377	BTS-470K	Isolation

Note 2. Some models use 2200 resistor in this application.
Note 3. Some models use 2.2 Meg. resistor in this application.
Note 4. Not used in all models.
Note 5. Some models use 150KΩ resistor in this application.
Note 6. Used in chassis TS-14 and TS-23 only.

TRANSFORMER (FILAMENT)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC	6.3VAC @ 1.49A	6.3VAC @ 1.7A	6.3VAC @ .6A	25B790141			
T2	234VAC	6.3VAC @ .108A	@ 1.2A		25B790140	P-6134 ①	P-2945 ①	F-633 ①

① Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T3	168Ω		24B790055				Hor. Osc. Coil
T4	215Ω	SEC. 1	24C790184				Hor. Output Trans.
	Tap @ .9Ω	.9Ω					
	48Ω	SEC. 2					
		.9Ω					
T5	770Ω	9.8Ω	25C790151	A-8112	A-3035 ①	TSO-5	Vert. Output Trans.
T6A	62Ω		24C780542				Hor. Deflection Coil
B	63Ω						Vert. Deflection Coil
T7	2200Ω		7K780176				Focus Coil

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T8	5.3KΩ	8Ω	305Ω	.3Ω	25B790686	A-3856	A-2900	RO-9 ②	② Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1A	100Ω	4Ω	50C790154 ④		5E100S	④ Used in table models.
B	100Ω	4Ω	50C790188 ⑤			⑤ Used in console models.
	CONE DIA.	V. C. DIA.				
SP2A	4 3/8"	9/16"	④			
B	8"		⑤			

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

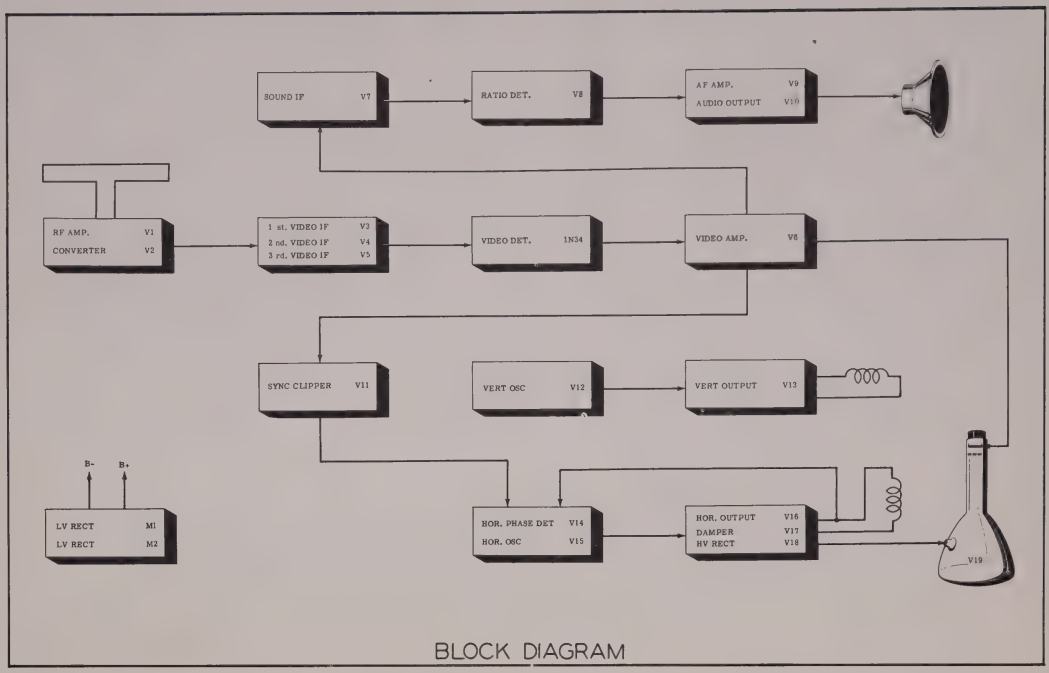
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
L1	Ant. Input Trans.	0Ω		24A790033		
L2	Ant. Coils	0Ω		24C790535		Part of tuner.
L3	RF Choke	8Ω		24K791446		10 microhenries
L4	RF Coils	0Ω		24K790536		Part of tuner.
L5	RF Coil	0Ω		24K790607		Channel #13
L6	Osc. Coils	0Ω		24K790537		Part of tuner.
L7	Osc. Coil	0Ω		24K790606		Channel #13
L8	RF Choke	2.5Ω		24K780128		2 microhenries
L9	1st Video IF	.3Ω	.2Ω	24K791134		Less tuning cores.
L10	RF Choke	4.5Ω		24K790035		5.6 microhenries
L11	2nd Video IF	.2Ω		24K791433		Less tuning core and clip.
L12	RF Choke	4.5Ω		24K790035		5.6 microhenries
L13	3rd Video IF	.2Ω		24K791433		Less tuning core and clip.
L14	4.5MC Trap	1Ω		24A470159		Less tuning core and clip.
L15	Peaking	9Ω		24A790579		Wound on 18KΩ resistor , green dot.
L16	Peaking	10Ω		24A790594		Yellow dot.
L17	Sound IF	1Ω		24A470159		Less core and clip.
L18	Ratio Det. Trans.	3Ω	.5Ω	24B790125		Includes cores and clips but less shield.
L19	Width. Cont.	24Ω		24B791170		Complete with core and clip.
L20	Fil. Choke	.2Ω		24K790145		.47 microhenries
L21	Fil. Choke	.2Ω		24K790145		.47 microhenries
L22	Fil. Choke	.2Ω		24K790145		.47 microhenries
L23	Fil. Choke	.2Ω		24K790145		.47 microhenries
L24	RF Choke	.2Ω		24K790145		.47 microhenries

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	MOTOROLA PART No.	SYLVANIA PART No.		
M1	.225A	48B780584	NF-5		
M2	.225A	48B780584	NF-5		

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	RF Tuner	1X780177	Channel selector switch, fine tuning, trimmer and coils assy.
M4A	4th Video IF	24A790175	Less core and clip.
B	RF Choke	24K791446	10 microhenries
C	RF Choke	24B790129	
D	Video Coupling	21K478234	8MMF
E	Video Det. Filter		6MMF } Video Detector Panel Assembly
F	RF Bypass	21A470790	1500MMF
G	Video Det. Load	6R2004	8.2KΩ
H	Video Detector	48A90173	1N34
M5	Ion Trap	24B484822	Permanent magnet type
	Core	46K480256	Iron and screw (L9 secondary)
	Core	46A470310	Iron and screw (L9 primary and L17)
	Core	46A70023	Iron and screw (L18 primary)
	Core	46A470302	Iron and screw (L18 secondary)
	Core	46K471143	Iron and screw (T3)
	Core	46A791119	With slide adjustment (L19)
	Corona Shield	1X780182	V18
	Socket	9A790685	Picture tube (octal)
	Cabinet	16F790486	Model 10VT10, Brown mahogany table model
	Cabinet	16K790487	Model 10VT10R, red mahogany table model.
	Cabinet	16F790601	Model 10VK12, brown mahogany consolette
	Cabinet	16K790595	Model 10VK12R, red mahogany consolette
	Cabinet	16E791045	Model 12VT13, brown mahogany table models.
	Cabinet	16K791047	Model 12VT13B limed oak table model.
	Cabinet	16K791046	Model 12VT13R, red mahogany table model.
	Cabinet	16F790664	Model 12VK11 Brown mahogany consolette
	Cabinet	16K790666	Model 12VK11B, limed oak consolette
	Cabinet	16K790665	Model 12VK11R, red mahogany consolette
	Safety Glass	61C790408	Models 10VT10, 10VT10R, 10VK12, 10VK12R
	Safety Glass	61K790653	Models 12VT13, 12VT13B, 12VT13R, 12VK11, 12VK11B, 12VK11R
	Safety Glass	13D790718	Models 12VT13, 12VT13B, 12VT13R
	Knob	36B790506	Channel selector, all models.
	Knob	36B790505	Contrast all models
	Knob	36K790621	Off-volume, fine tuning, models 10VT10, 10CK12, 12VT13, 12VK11
	Knob	36A790507	Off-volume, fine tuning, models 10VT10R, 10VK12R, 12VT13R, 12VK11R



BLOCK DIAGRAM

PHOTOFACT* Folder

PHILCO MODELS
49-1040, 49-1076, 49-1150, 49-1175,
49-1240, 49-1278

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MODEL 49-1175

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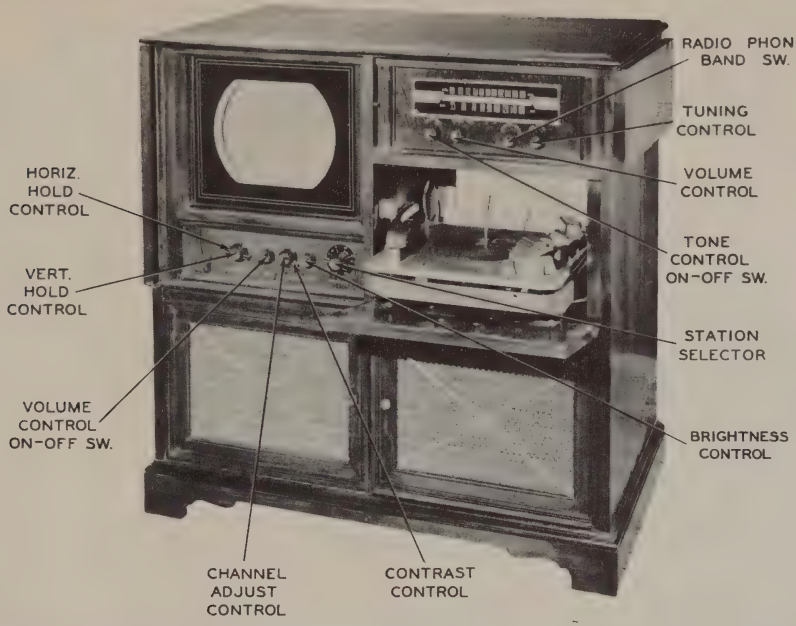

TRADE NAME	Philco Models, 49-1040 (Code 123), 49-1076 (Code 123), 49-1077 (Code 122), 49-1150 (Code 122 & 124), 49-1175 (Code 122 & 124), 49-1240 (Code 124), 49-1278 (Code 123), 49-1279 (Code 122), 49-1280 (Code 121)
MANUFACTURER	Philco Corp., Tioga and "C" Sts., Philadelphia, Pa.
TYPE SET	TV-AM-FM-Phono Combination Receiver (Some Models "TV" Only).
TUBES	Thirty Three(Combination Receivers) Twenty Six ("TV Only" Receivers)
POWER SUPPLY	110-120 Volts AC-60 Cycle
TUNING RANGE	TV Channels 2 thru 13, FM 88 - 108MC, AM 540 - 1620KC
RATING	2 Amp. @ 117 Volts AC (TV), .46 Amp. @ 117 Volts AC (Radio)

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FOR SERVICE INFORMATION ON RECORD CHANGER UNIT, SEE PHILCO MODEL M-9C PHOTOFACT SET #74 FOLDER #7 OR RECORD CHANGER MANUAL CM-2.

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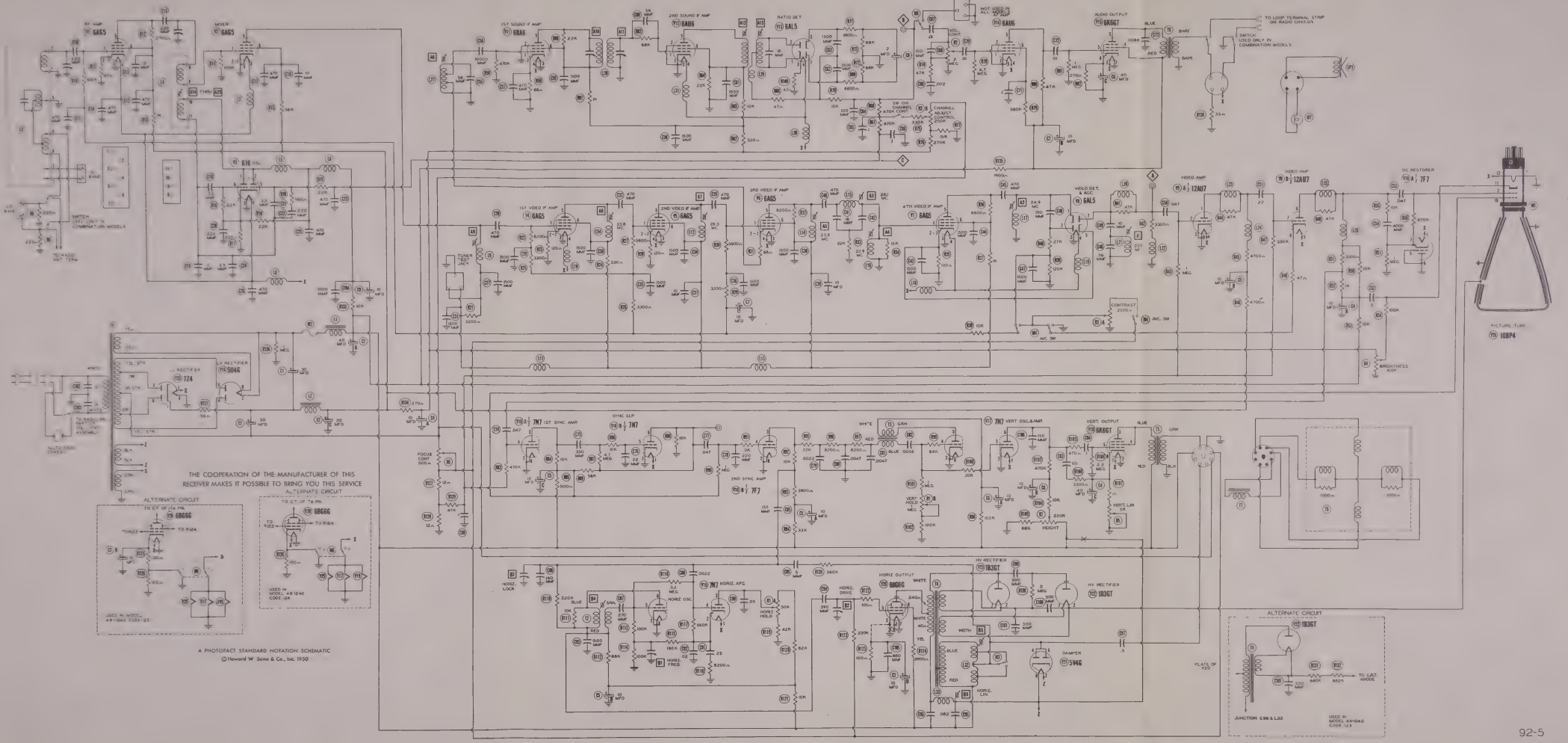
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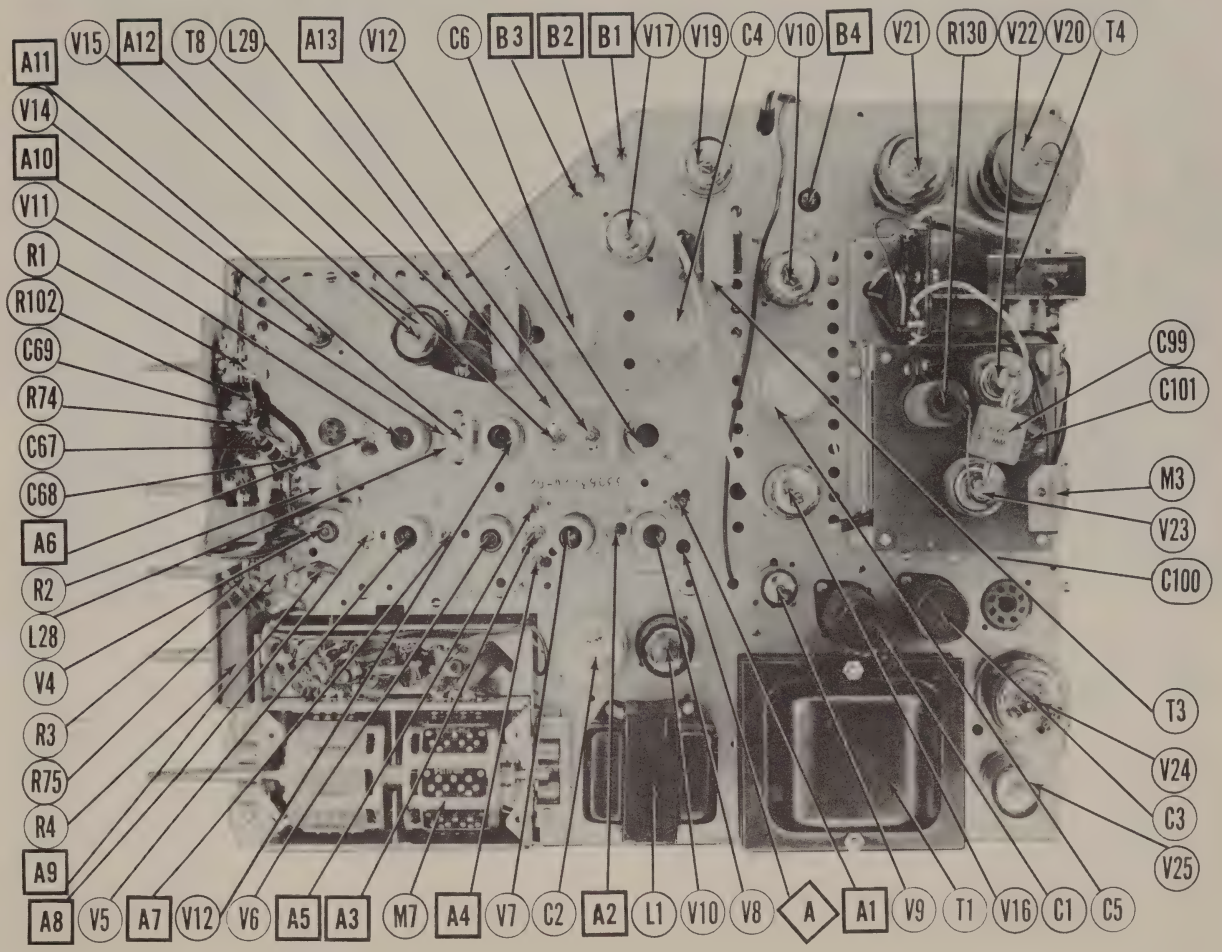
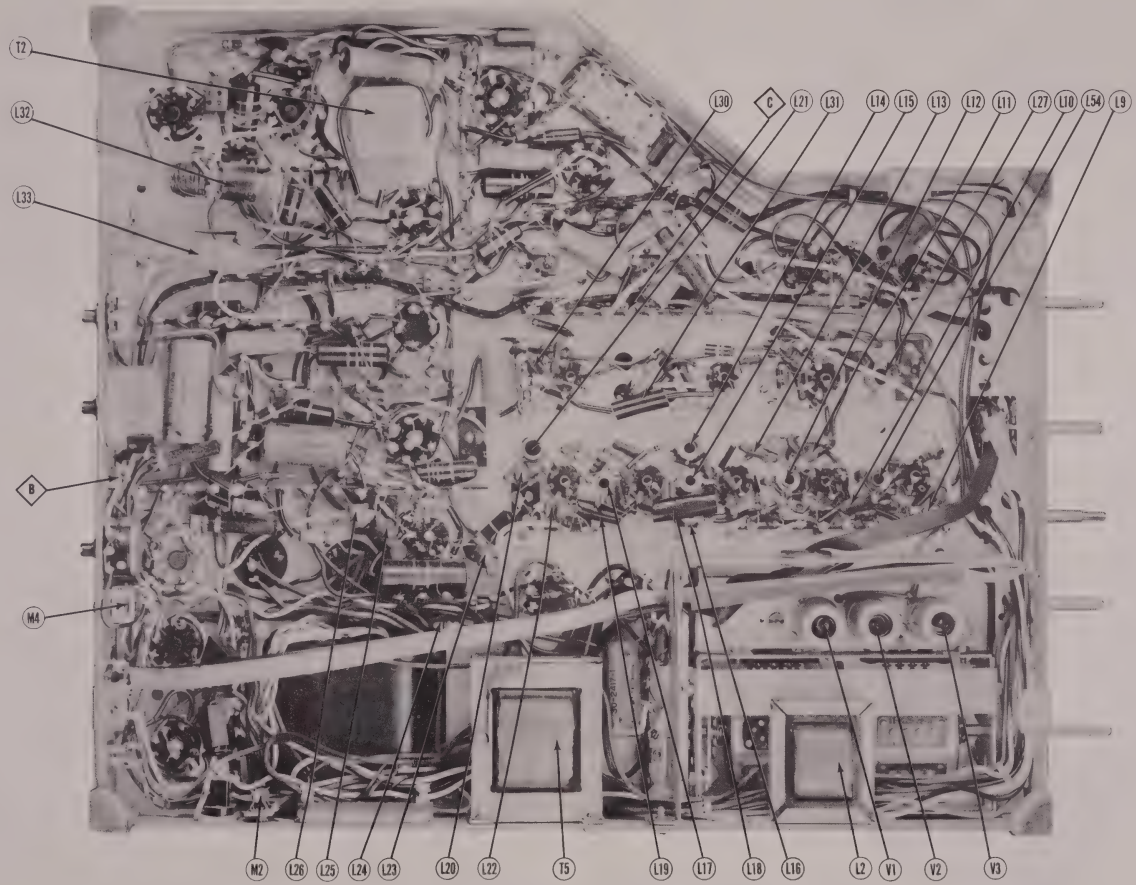
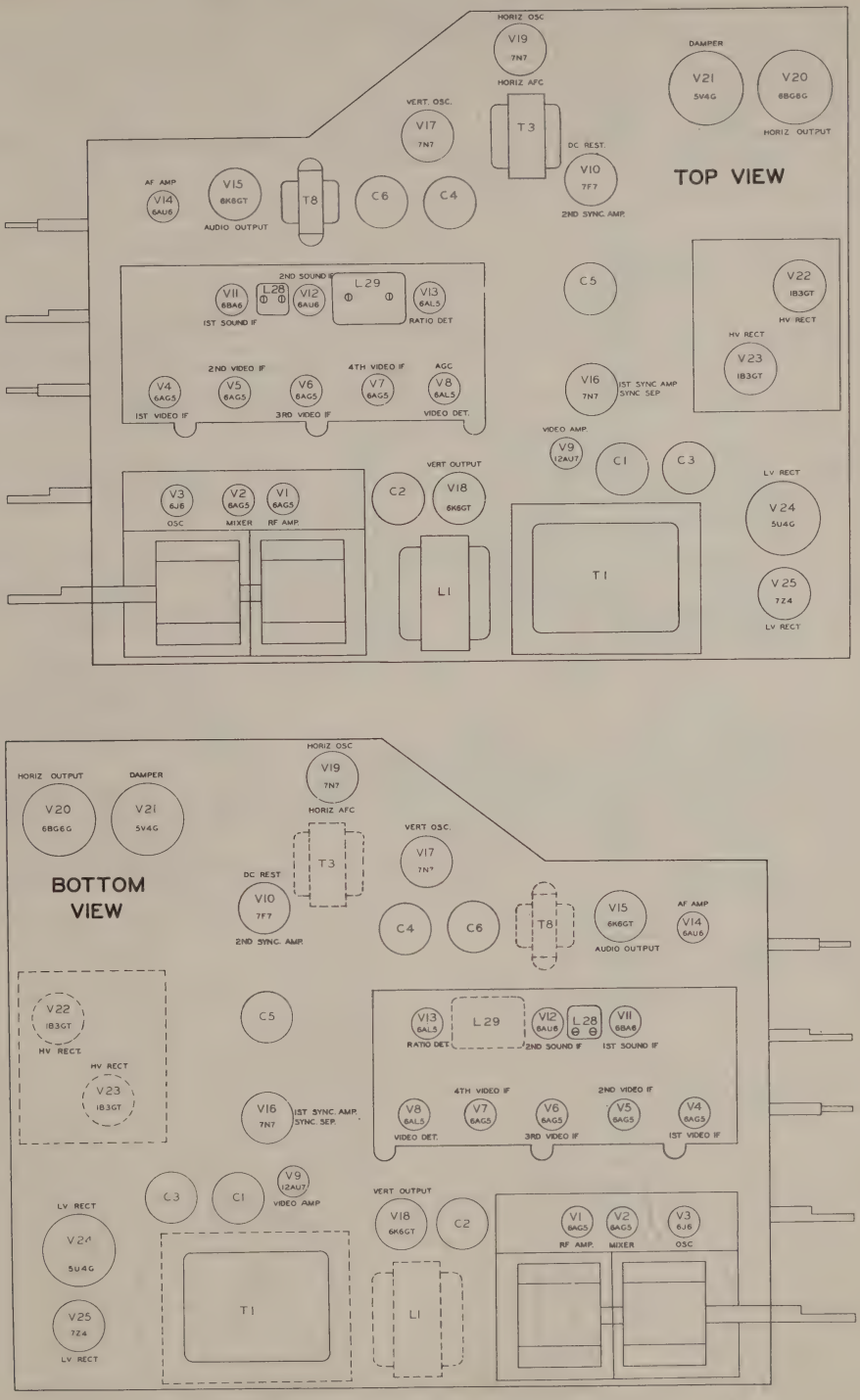


TV CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



TUBE PLACEMENT CHART

PHILCO MODELS 49-1040, 49-1076, 49-1077, 49-1150, 49-1175, 49-1240, 49-1278, 49-1279, 49-1280

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Turn the AVC switch to the "off" position and set the contrast control at approximately 3/4 of its rotation in the clockwise direction.
Pull the horizontal oscillator tube (7N7-V19) to eliminate the high voltage shock hazard during the alignment procedure.

VIDEO IF ALIGNMENT

Remove the oscillator tube (6J6-V3) and remove the oscillator clip coil of any channel from the turret and switch the tuner to that channel.
Use an ungrounded tube shield over the mixer tube as a means of injecting the signal.
Attenuate the signal generator so as not to exceed 2 volts on the VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.		High side to ungrounded tube shield over mixer tube (V2). Low side to chassis.	22.1MC (Unmod.)	Any	DC Probe to Point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.		"	24.9MC (Unmod.)	"	"	A2	Adjust for maximum deflection.
3.		"	28.1MC (Unmod.)	"	"	A3	Adjust for MINIMUM deflection.
4.		"	23.9MC (Unmod.)	"	"	A4, A5	Adjust for maximum deflection.
5.		"	22.1MC (Unmod.)	"	"	A6	Adjust for MINIMUM deflection.
6.		"	26.3MC (Unmod.)	"	"	A7	Adjust for maximum deflection.
7.		"	25.8MC (Unmod.)	"	"	A8	Adjust for maximum deflection.

OVERALL VIDEO IF RESPONSE CHECK

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.		High side to ungrounded tube shield over mixer tube (V2). Low side to chassis.	25MC (10MC SWP)	22.1MC 26.6MC 28.1MC	Any	Vert. Amp. thru 10KΩ resistor to Point (A). Low side to chassis.	A1, A2, A3, A4, A5, A6, A7, A8, A9	Adjust for pattern and placement of markers as per Fig 1.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.		High side to ungrounded tube shield over mixer tube (V2). Low side to chassis.	22.1MC (1MC SWP)	22.1MC	Any	Vert. Amp. thru 10KΩ resistor to Point (B). Low side to chassis.	A10, A11	Adjust for maximum indications.
10.		"	"	"	"	"	A12, A13	Adjust A12 for maximum amplitude and straightness of diagonal line going from peak to peak. Adjust A13 so 22.1MC marker is located at center of diagonal line as per Fig 2. Replace oscillator tube (V3).

OSCILLATOR ALIGNMENT

The oscillator alignment should not be attempted until the sound IF channel has been accurately aligned.
Disable the AFC system during the oscillator alignment by temporarily grounding Point (C).
The oscillator coil slug adjustments are available through the hole in the front panel of the chassis. As each channel is switched in, the oscillator coil slug for that channel is in line with the hole in front of the chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	Two 125Ω carbon res.	Across high band antenna terminals with 125Ω resistor in each generator lead.	215.75MC	13	DC Probe to Point (B). Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
12.	"	"	209.75MC	12	"	A15	"
			203.75MC	11		A16	
			197.75MC	10		A17	
			191.75MC	9		A18	
			185.75MC	8		A19	
			179.75MC	7		A20	
13.	"	Across low band antenna terminals with 125Ω resistor in each generator lead.	87.75MC	6	"	A21	"
			81.75MC	5		A22	
			71.75MC	4		A23	
			65.75MC	3		A24	
			59.75MC	2		A25	

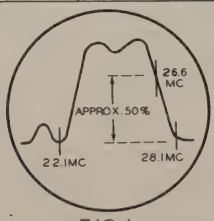


FIG. 1

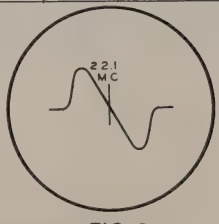


FIG. 2

RADIO ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If alignment is to be done on both **FM** and **AM** bands, the **AM** alignment should be done first.
Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

The calibration points should be marked by pencil on the dial backplate when the receiver is removed from the cabinet. The reference point from which the measurements are made is the left hand edge of the dial backplate. Pointer setting with tuning gang closed 3 11/16", 1500KC- 9 1/16", 1600KC-9 7/16", 92MC-5 5/16", and 105MC-8 7/16".

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
14	.1MFD	High side to terminal #1 of AM antenna terminal strip. Low side to B-.	455KC	AM	540KC	Across terminal #2 & #3 on AM antenna terminal strip.	A26, A27, A28, A29, A30, A31	Adjust for maximum output. If isolation transformer is not used reduce dummy antenna to .001MFD to reduce hum modulation. Do not repeat adjustments.
15		Loop	1600KC	"	1600KC	"	A32	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
16		Loop	1500KC	"	1500KC	"	A33	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ resistor (± 5%) in series from pin 2 of 19T8 (V30) to chassis. The junction of these resistors is alignment Point Ⓔ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
17	.1MFD	High side to pin 1 (Grid) of 6BJ6 (V28). Low side to B-.	9.1MC (Unmod.)	FM	88MC	DC Probe to Point Ⓓ. Common to B-.	A34, A35, A36	Adjust for maximum deflection.
18	.1MFD	High side to pin 8 (Grid) of 7F8 (V26). Low side to B-.	"	"	"	"	A37, A38	"
19	.1MFD	"	"	"	"	DC Probe to Point Ⓔ. Common to Point Ⓕ.	A39	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
17	.1MFD	High side to pin 1 (Grid) of 6BJ6 (V28). Low side to B-.	9.1MC (450KC SWP)	FM	88MC	Vert. Amp. to Point Ⓓ. Low side to B-.	A34, A35, A36	Disconnect stabilizer cap. (C109). Adjust for maximum amplitude and symmetry as per Fig 3.
18	.1MFD	High side to pin 8 (Grid) of 7F8 (V26). Low side to B-.	"	"	"	"	A37, A38	"
19	.1MFD	"	"	"	"	Vert. Amp. to Point Ⓕ. Low side to B-.	A39	Reconnect stabilizer cap (C109). Adjust so crossover point occurs at center of pattern as per Fig 4. Slightly retouch A34 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
20	Two 125Ω carbon res.	Across pins 1 and 4 of FM antenna socket with 125Ω resistor in each generator lead.	105MC	FM	105MC	DC Probe to Point Ⓓ. Common to B-.	A40	Adjust for maximum deflection.
21	"	"	"	"	"	"	A41, A42	Rock tuning gang and adjust for maximum deflection.
22	"	"	92MC	"	92MC	"	L40, L37, L35	Expand or compress the coil turns, which ever is necessary, until the insertion of either end of a tuning wand will cause a decrease in the VTVM reading. Repeat steps 20, 21, and 22 until no further improvement can be made.

FIG. 3

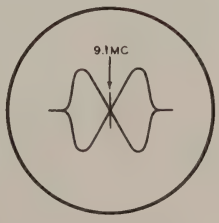


FIG. 4

PHILCO MODELS 49-1040, 49-1076, 49-1077, 49-1150, 49-1175, 49-1240, 49-1278, 49-1279, 49-1280

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-2.3VDC	.6VDC	0V.	6.3VAC	160VDC	150VDC	.6VDC		
V 2	6AG5	-2VDC	0V.	6.3VAC	0V.	135VDC	80VDC	0V.		
V 3	6J6	125VDC	125VDC	0V.	6.3VAC	§-10VDC	0V.	3.5VDC		
V 4	6AG5	-3VDC	1.1VDC	0V.	6.3VAC	130VDC	130VDC	1.1VDC		
V 5	6AG5	-.2VDC	1.2VDC	0V.	6.3VAC	135VDC	135VDC	1.2VDC		
V 6	6AG5	-.2VDC	1.1VDC	0V.	6.3VAC	135VDC	135VDC	1.1VDC		
V 7	6AG5	0V.	1.2VDC	0V.	6.3VAC	80VDC	125VDC	1.2VDC		
V 8	6AL5	0V.	-.3VDC	0V.	6.3VAC	1.1VDC	0V.	-.2VDC		
V 9	12AU7	125VDC	-.9VDC	0V.	6.3VAC	6.3VAC	280VDC	-1.5VDC	8.7VDC	0V.
V 10	7F7	6.3VAC	0V.	135VDC	1VDC	0V.	0V.	.7VDC	0V.	
V 11	6BA6	0V.	0V.	0V.	6.3VAC	110VDC	110VDC	1.3VDC		
V 12	6AU6	-.4VDC	0V.	0V.	6.3VAC	65VDC	65VDC	0V.		
V 13	6AL5	-1.9VDC	-1.9VDC	1.2VAC	6.3VAC	0V.	0V.	-2VDC		
V 14	6AU6	-.4VDC	0V.	0V.	6.3VAC	185VDC	50VDC	0V.		
V 15	6K6GT	0V.	6.3VAC	210VDC	230VDC	0V.	0V.	0V.	11VDC	
V 16	7N7	6.3VAC	0V.	160VDC	-1.1VDC	-.5VDC	29VDC	0V.	0V.	
V 17	7N7	6.3VAC	0V.	310VDC	-75VDC	-80VDC	40VDC 210VDC	0V.	0V. 26VDC	
V 18	6K6GT	0V.	0V.	320VDC	320VDC	0V.	6.3VAC	6.3VAC	32VDC	
V 19	7N7	6.3VAC	-14VDC	40VDC	-2.3VDC	-39VDC	160VDC	0V.	0V.	
V 20	6BG6G	0V.	6.3VAC	0V.	-12VDC	-12VDC	320VDC	0V.	290VDC	TOP CAP *
V 21	5V4G	0V.	380VDC	0V.	330VDC	0V.	330VDC	0V.	380VDC	
V 22	1B3GT	* DO NOT MEASURE.								
V 23	1B3GT	* DO NOT MEASURE.								
V 24	5U4G	0V.	350VDC	0V.	350VAC	0V.	350VAC	0V.	350VDC	
V 25	7Z4	6.3VAC	0V.	210VAC	0V.	0V.	210VAC	170VDC	0V.	
V 26	10BP4	0V.	.3VDC	PIN 10 250VDC	PIN 11 130VDC	PIN 12 6.3VAC				
† V 27	12AU6	.4VDC	2.6VDC	43VAC	55VAC	200VDC	150VDC	3.8VDC		
† V 28	14F8	§-1VDC	31VAC	80VDC	1.8VDC	5VDC	115VDC	18VDC	1.7VDC	
V 29	12AU7	55VDC	§-2VDC	1.8VDC	31VAC	43VAC	120VDC	4.5VDC	6.2VDC	37VAC
V 30	6BJ6	-.1VDC	2.2VDC	55VAC	62VAC	140VDC	140VDC	1.8VDC		
V31	6BJ6	0V.	1VDC	62VAC	69VAC	190VDC	110VDC	0V.		
V32	19T8	-.5VDC	-1.2VDC	-.5VDC	0V.	18VAC	-.6VDC	0V.	-.8VDC	67VDC
† V32	19T8	-.5VDC	-1.2VDC	-.5VDC	0V.	18VAC	-.6VDC	0V.	-.8VDC	67VDC
V33	50C6G	0V.	117VAC	190VDC	150VDC	0V.	0V.	69VAC	15VDC	

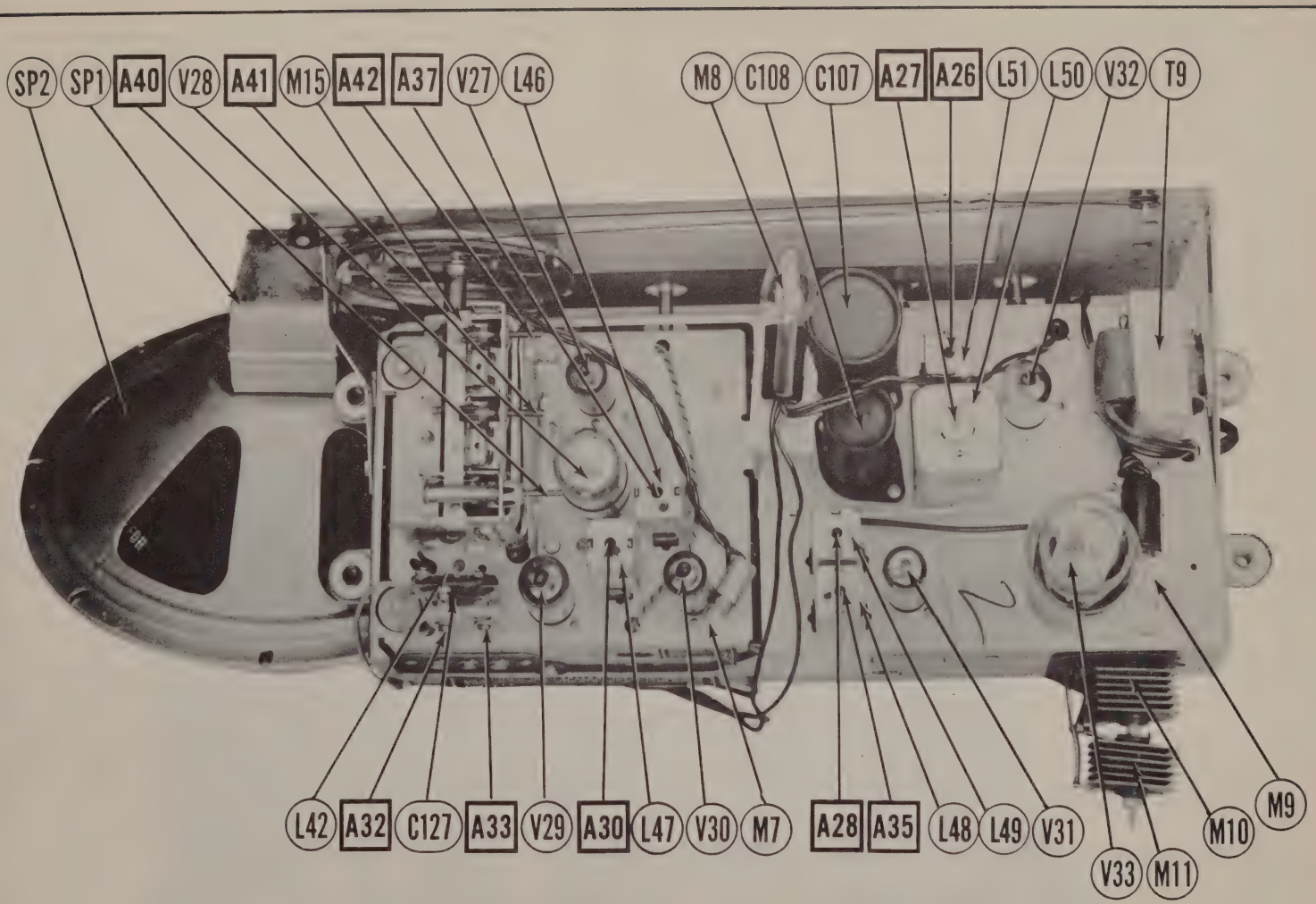
§ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.
† TAKEN IN "FM" POSITION.

RESISTANCE READINGS

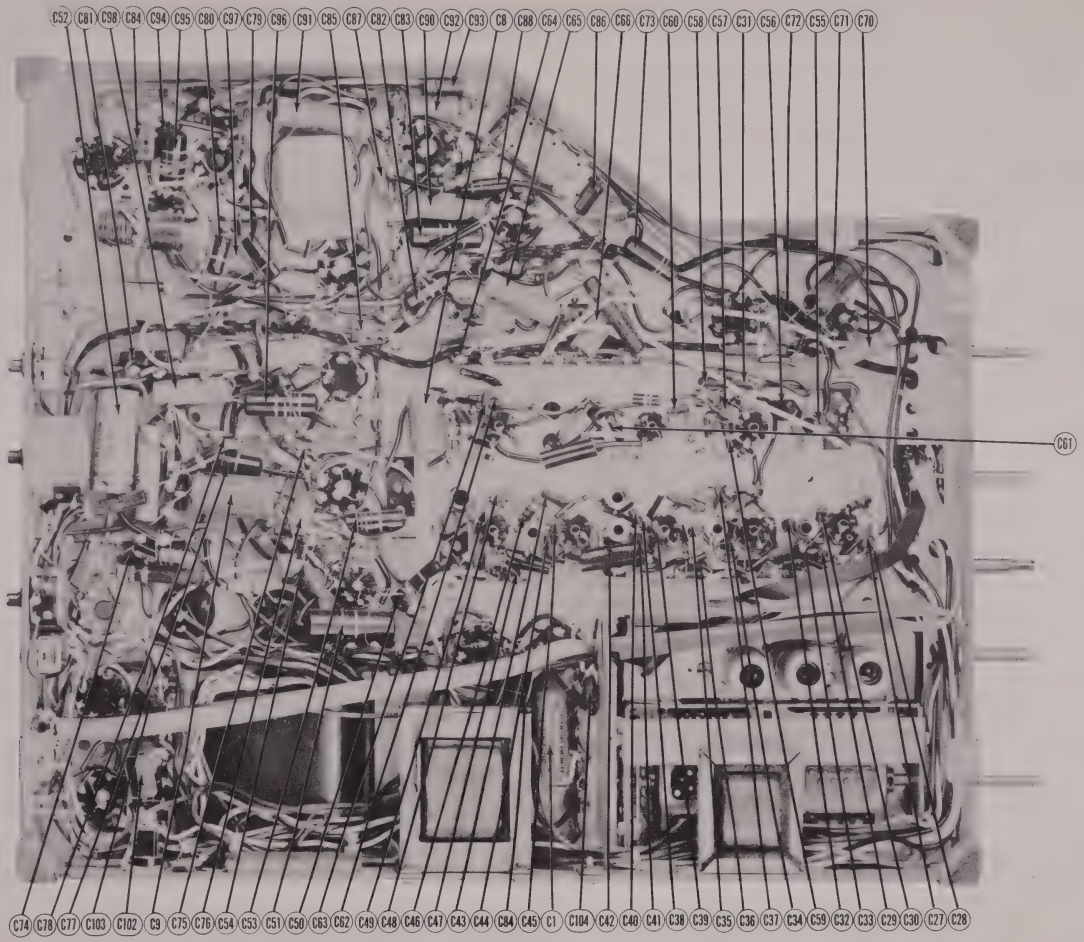
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	230KΩ	47Ω	0Ω	.1Ω	†3.9KΩ	†1.2KΩ	47Ω		
V 2	6AG5	100KΩ	0Ω	.1Ω	0Ω	†3.5KΩ	†56KΩ	0Ω		
V 3	6J6	#8KΩ	#8KΩ	0Ω	.1Ω	800KΩ	22KΩ	220Ω		
V 4	6AG5	140KΩ	120Ω	0Ω	.1Ω	†800Ω	†800Ω	120Ω		
V 5	6AG5	135KΩ	120Ω	0Ω	.1Ω	†470Ω	†470Ω	120Ω		
V 6	6AG5	135KΩ	68Ω	0Ω	.1Ω	†470Ω	†470Ω	68Ω		
V 7	6AG5	.2Ω	100Ω	0Ω	.1Ω	†8KΩ	†1.5KΩ	100Ω		
V 8	6AL5	.2Ω	150KΩ	0Ω	.1Ω	100Ω	Inf.	3.3KΩ		
V 9	12AU7	†9.8KΩ	1 Meg.	0Ω	.1Ω	.1Ω	#14KΩ	380KΩ	3KΩ	0Ω
V 10	7F7	.1Ω	0Ω	#47KΩ	1 Meg.	0Ω	0Ω	1 Meg.	0Ω	
V 11	6BA6	470KΩ	0Ω	0Ω	.1Ω	†1.8KΩ	†1.8KΩ	68Ω		
V 12	6AU6	68KΩ	0Ω	0Ω	.1Ω	†10KΩ	†10KΩ	0Ω		
V 13	6AL5	750KΩ	750KΩ	3Ω	.1Ω	75KΩ	Inf.	75KΩ		
V 14	6AU6	4.7 Meg.	0Ω	0Ω	.1Ω	#49KΩ	#560KΩ	0Ω		
V 15	6K6GT	Inf.	.1Ω	#2.8KΩ	#2KΩ	1 Meg.	Inf.	0Ω	270Ω	
V 16	7N7	.1Ω	0Ω	#15KΩ	500KΩ	4.7 Meg.	#20KΩ	0Ω	0Ω	
V 17	7N7	.1Ω	0Ω	#90KΩ	2 Meg.	2 Meg.	¶750KΩ ¶500KΩ	0Ω	0Ω	
V 18	6K6GT	Inf.	0Ω	#650Ω	#650Ω	2.2 Meg.	.1Ω	.1Ω	6KΩ 1000Ω	
V 19	7N7	.1Ω	280KΩ	#42KΩ	800KΩ	200KΩ	#78KΩ	0Ω	0Ω	
V 20	6BG6G	Inf.	.1Ω	0Ω	220KΩ	220KΩ	#560KΩ	0Ω	#4KΩ	TOP CAP ¶50Ω
V 21	5V4G	Inf.	230KΩ	Inf.	#85Ω	Inf.	#85Ω	Inf.	230KΩ	
V 22	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP Inf.
V 23	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ¶ 180Ω
V 24	5U4G	Inf.	20KΩ	Inf.	♦18Ω	Inf.	♦18Ω	Inf.	20KΩ	
V 25	7Z4	.1Ω	Inf.	♦11Ω	Inf.	Inf.	♦10.5Ω	25KΩ	0Ω	
V 26	10BP4	0Ω	1.5 Meg.	PIN 10 #5KΩ	PIN 11 140KΩ	PIN 12 .1Ω				
† V 27	12AU6	1 Meg.	140Ω	27Ω	29Ω	▲180Ω	▲15KΩ	240Ω		
† V 28	14F8	15KΩ	22Ω	▲20KΩ	68Ω	1.5KΩ	▲20KΩ	16Ω	10KΩ	
V 29	12AU7	▲43KΩ	15KΩ	68Ω	22Ω	27Ω	▲20KΩ	4.5 Meg.	1.5KΩ	25Ω
V 30	6BJ6	4.5 Meg.	115Ω	29Ω	29Ω	▲4.3KΩ	▲4.3KΩ	68Ω		
V31	6BJ6	10Ω	68Ω	29Ω	28Ω	▲1.1KΩ	▲13KΩ	0Ω		
V32	19T8	Inf.	47KΩ	Inf.	0Ω	16Ω	370KΩ	0Ω	10 Meg.	▲270KΩ
† V32	19T8	Inf.	47KΩ	Inf.	0Ω	16Ω	370KΩ	0Ω	10 Meg.	▲270KΩ
V33	50C6G	0Ω	3Ω	▲360Ω	▲3.3KΩ	470KΩ	0Ω	28Ω	220Ω	

NOTE: AVC SWITCH IN "ON" POSITION FOR THESE MEASUREMENTS.
† MEASURED FROM PIN 7 OF V25.
# MEASURED FROM PIN 8 OF V24.
¶ MEASURED FROM PIN 8 OF V21.
♦ MEASURED FROM PIN 7 OF DEFLECTION COIL PLUG.
▲ MEASURED FROM OUTPUT OF M11.
† TAKEN IN "FM" POSITION.

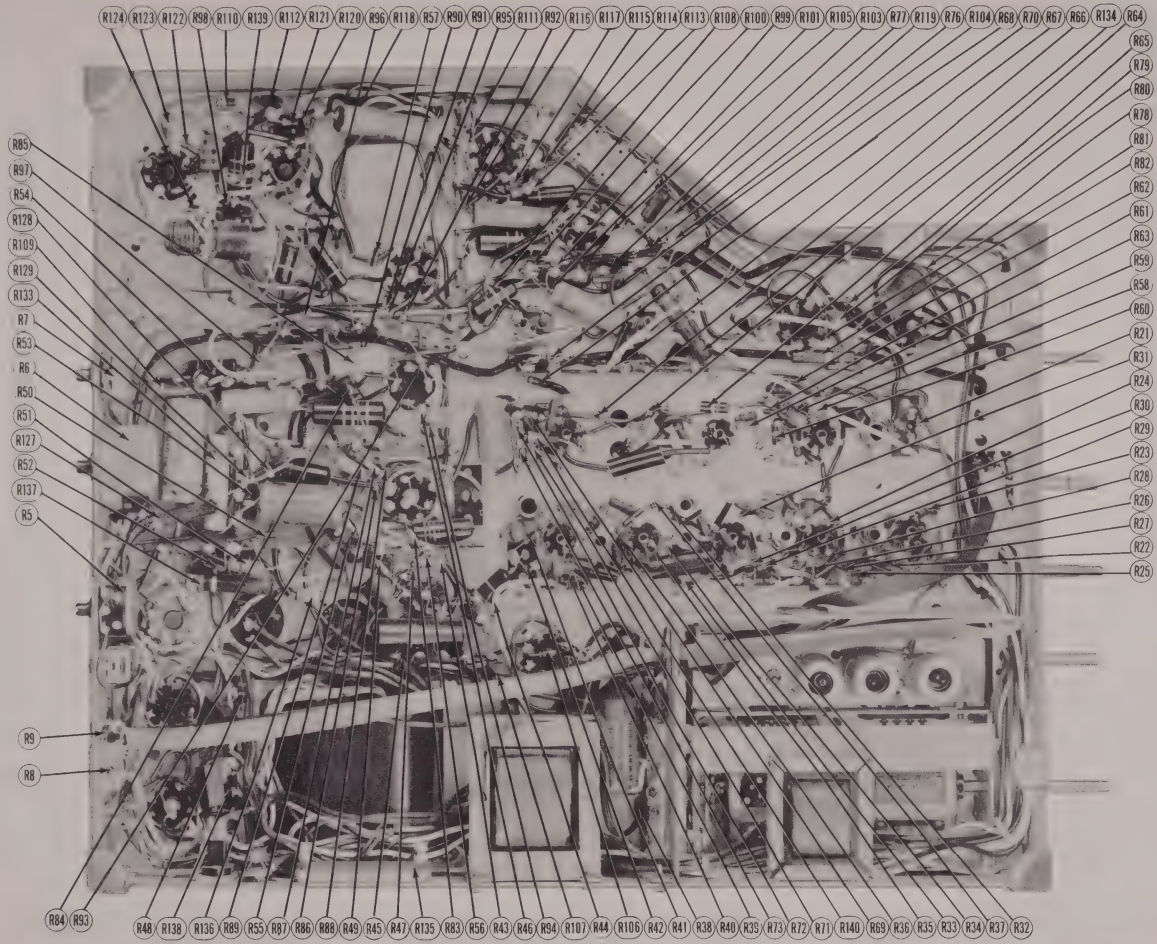
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



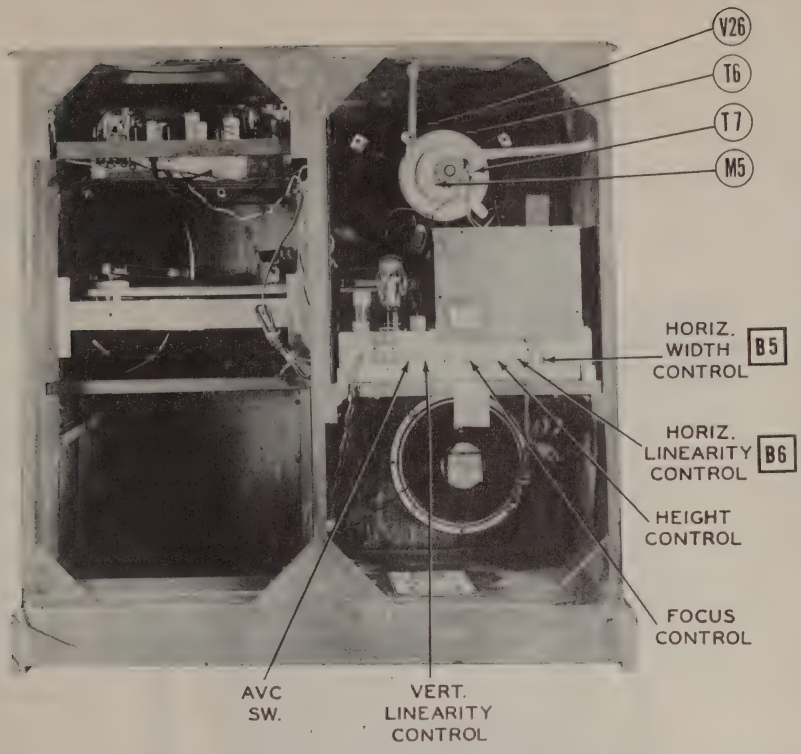
RADIO CHASSIS-TOP VIEW



TV CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION



TV CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CABINET–REAR VIEW

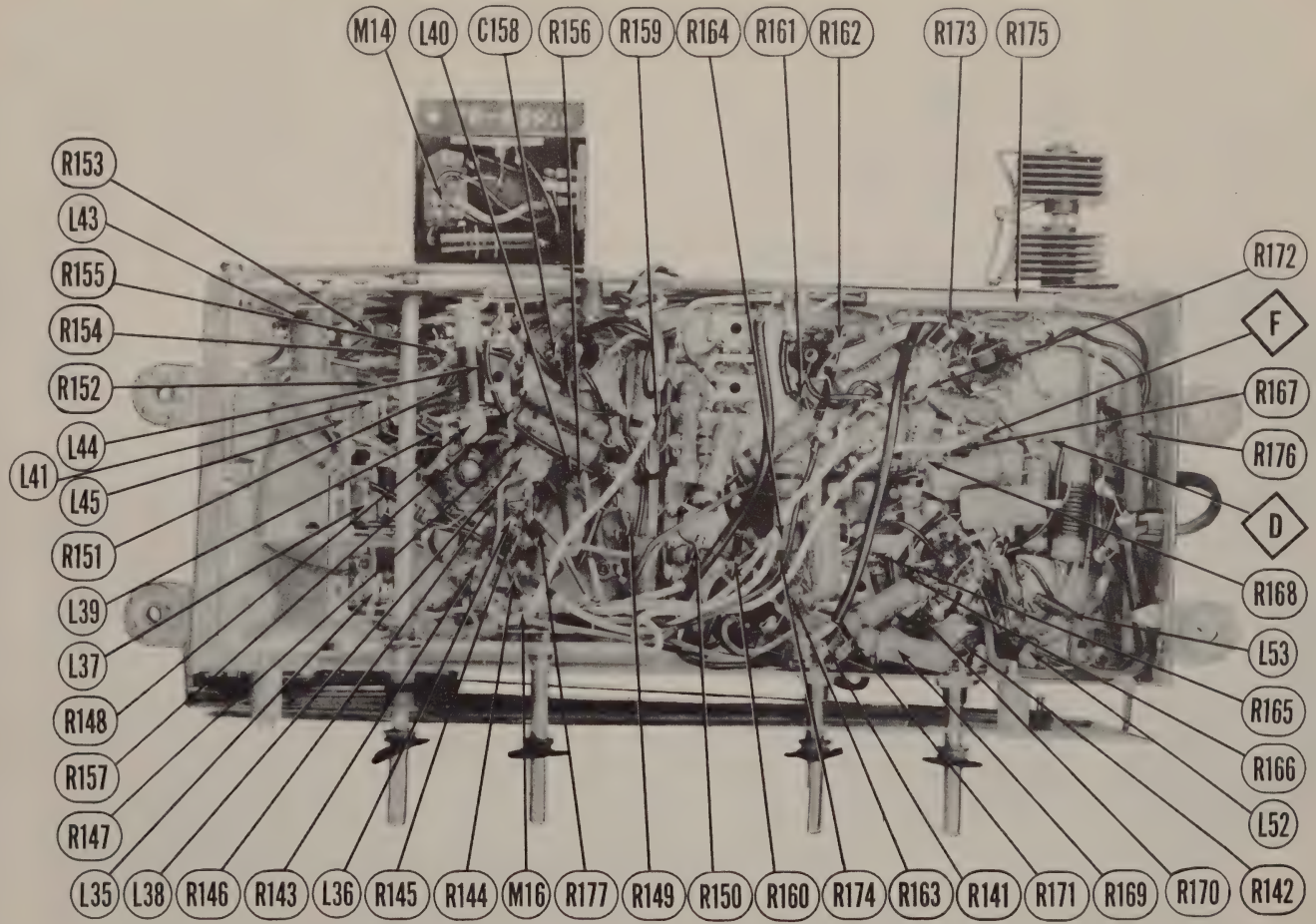
HORIZONTAL OSCILLATOR ADJUSTMENTS

1. Turn B1 (Frequency Adj.) one and a half turns from the maximum clockwise position.
2. Turn B2 (Drive Adj.) two turns from the maximum clockwise position.
3. Turn B3 (Horiz. Lock Trimmer) one half turn from the maximum clockwise position.
4. Set the horizontal hold control R1A to the center of its rotation.
5. Turn in a station and adjust B4 until picture "sync".
6. Turn the AVC "off" and adjust the contrast control (R3) for normal contrast.
7. Turn the horizontal hold control fully clockwise and adjust B4 until 8 to 10 blanking bars appear on the picture tube, sloping downward from the left side.
8. If this cannot be done turn B1 one turn counter-clockwise and repeat step 7.
9. Turn the horizontal hold control in the counter-clockwise direction until picture "sync".
10. Keep turning the horizontal hold control in the counter-clockwise direction until the picture falls out of "sync".
11. If the picture will not fall out of "sync" with the horizontal hold control turned fully counter-clockwise, turn the contrast control counter-clockwise until picture falls out of "sync" and then clockwise to the point where the picture reappears, but not in "sync".
12. Advance the horizontal hold control clockwise and count the number of blanking bars present. This number should decrease as synchronization is neared.
13. Just before the picture drops into "sync" there should be $3\frac{1}{2}$ to $4\frac{1}{2}$ bars sloping upward from the left side of the picture.
14. If more than $4\frac{1}{2}$ bars were present as outlined in step 13, turn B3 clockwise 1/4 turn and repeat steps 7 through 14. If less than $3\frac{1}{2}$ bars were present, turn B3 counter-clockwise 1/4 turn and repeat steps 7 through 14.

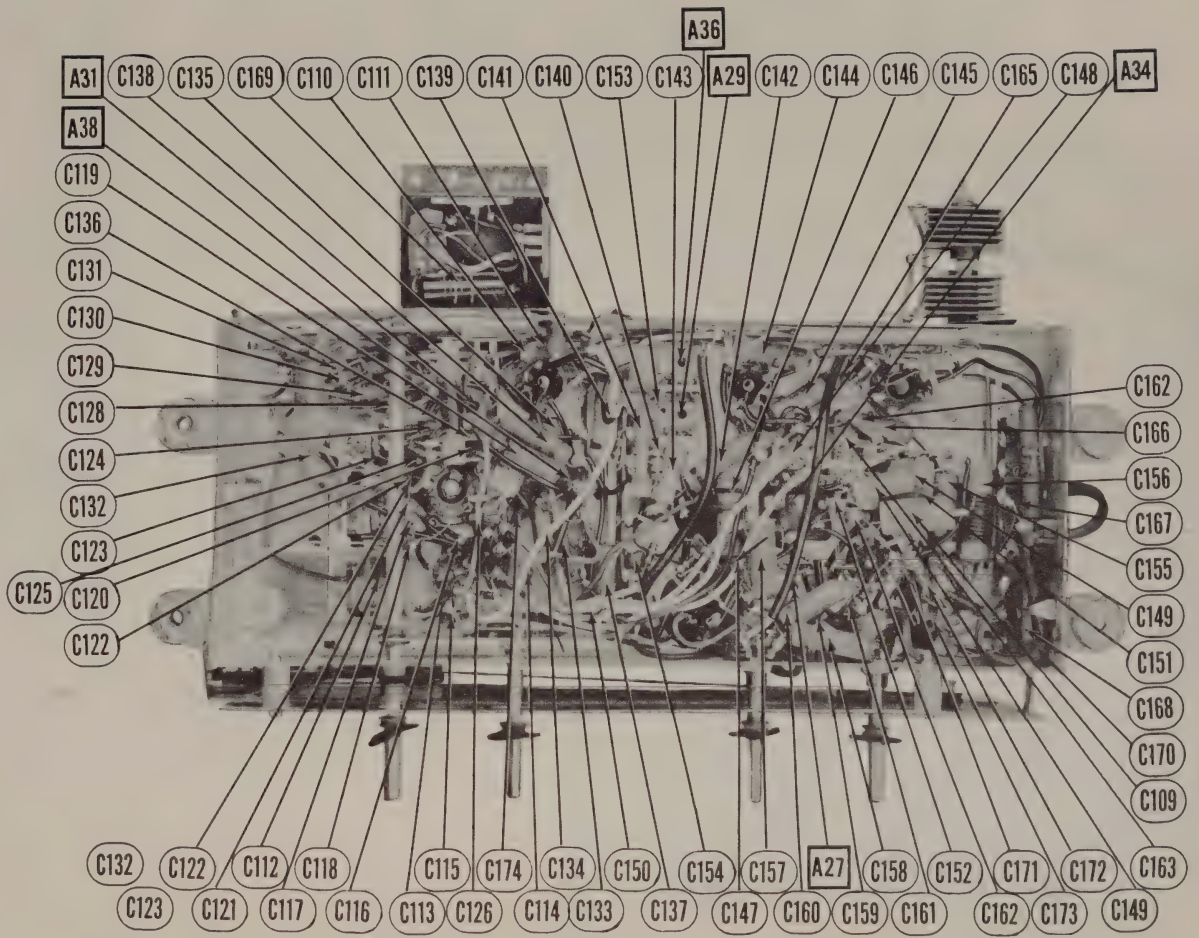
HORIZONTAL WIDTH AND LINEARITY ADJUSTMENTS

Adjust the width slug (B5) until the picture fills the mask horizontally.

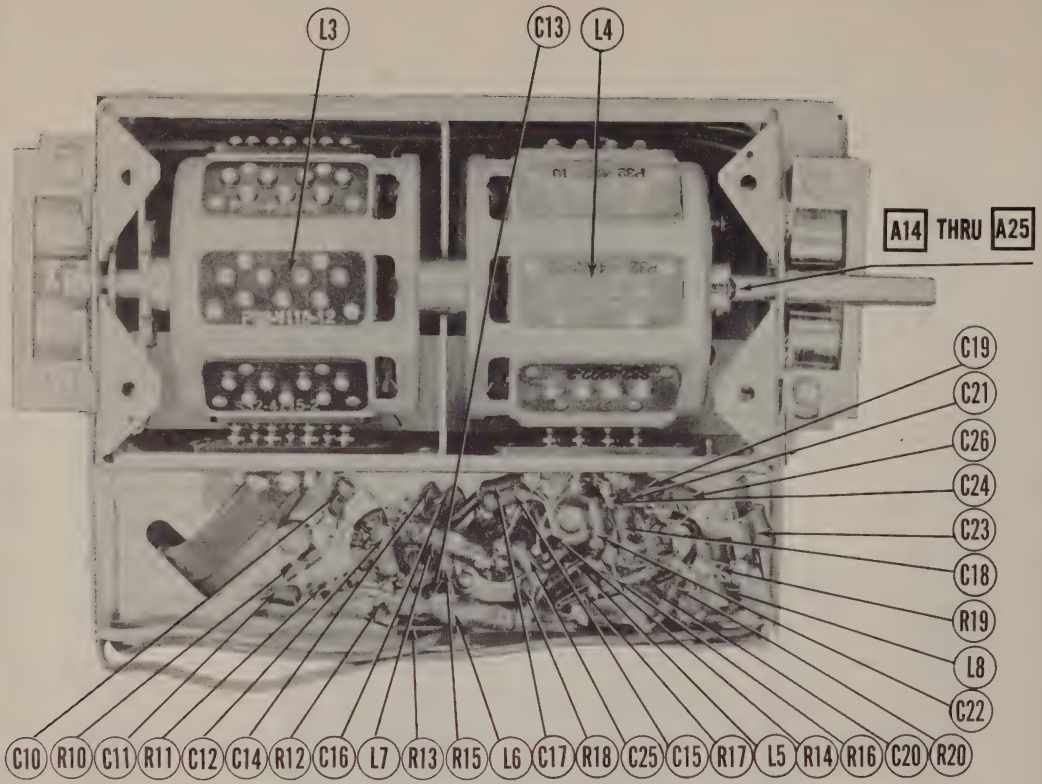
Adjust the horizontal linearity slug (B6) until the picture is symmetrical from left to right. Slight readjustment of the horizontal drive (B2) may be necessary.



RADIO CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION



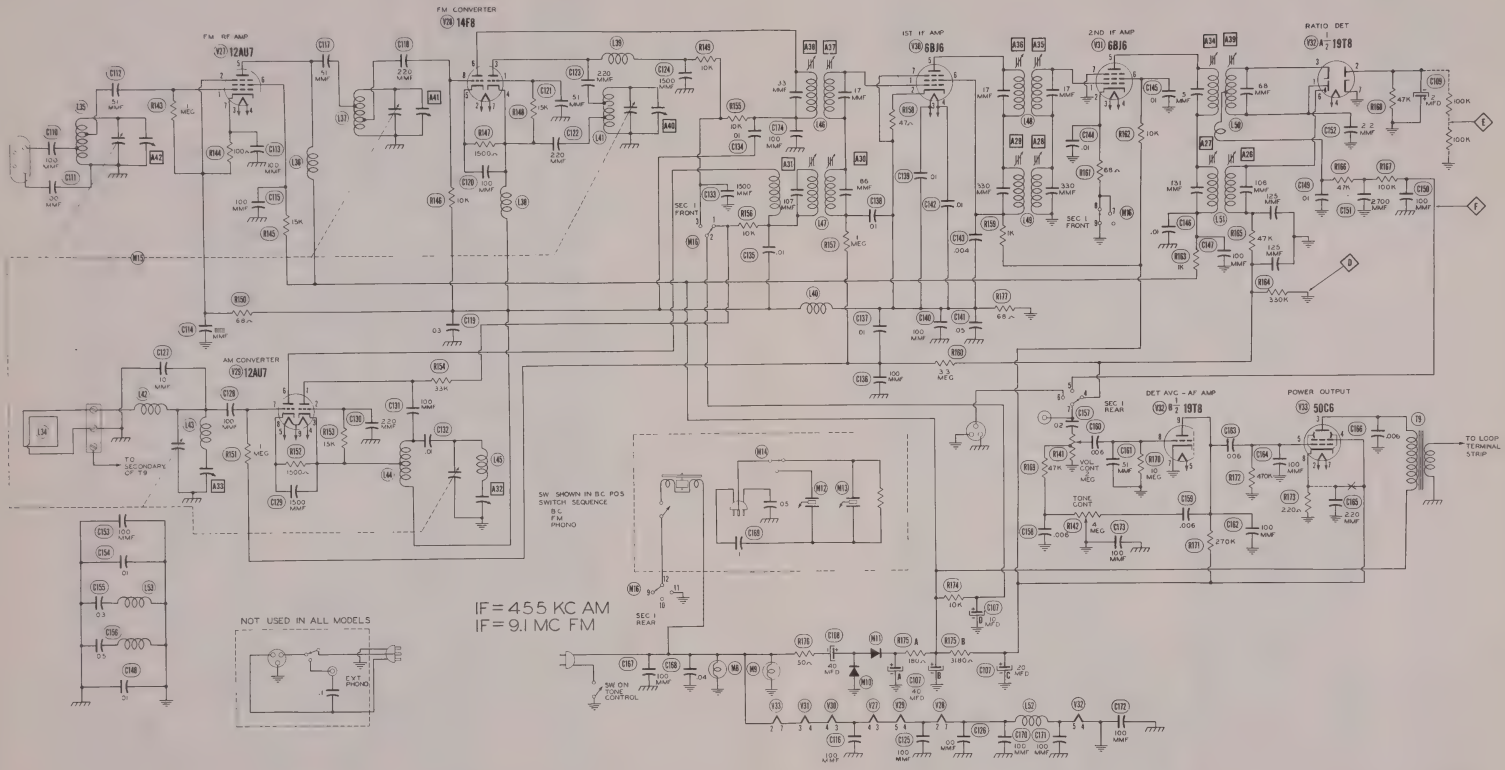
RADIO CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION



TV RF TUNER

DISASSEMBLY INSTRUCTIONS

1. Remove nine push-on type control knobs from TV and radio.
2. Remove twelve phillips head screws holding rear cover of TV section. Remove cover.
3. Remove twelve phillips head screws holding rear cover of radio-phono section. Remove cover.
4. Remove two phillips head screws holding rear cover of radio. Remove cover.
5. Remove speaker plug.
6. Remove picture tube base socket and HV cap.
7. Remove yoke plug.
8. Remove TV antenna plug from receiver chassis.
9. Remove green and black leads from terminals on rear of radio.
10. Remove power plug from TV chassis, left rear side.
11. Remove four 5/16" hex head bolts holding TV chassis. Remove chassis.
12. Remove two lamp sockets from bottom front center of cabinet.
13. Remove four 11/32" hex nuts holding speaker. Remove speaker.
14. Remove two phillips head screws holding rear picture tube supports.
15. Remove three 7/16" hex nuts holding front picture tube support. Remove picture tube.
16. Unsolder phono motor leads at splices.
17. Remove loop antenna leads from terminal strip.
18. Remove audio plug from rear of radio chassis.
19. Remove four 3/8" hex head bolts holding radio chassis. Remove chassis.
20. Remove phono plug from switch assembly under radio mounting board.
21. Remove two phillips head screws holding switch assembly and remove.



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RADIO SCHEMATIC

PHILCO MODELS 49-1040, 49-1076, 49-1077, 49-1150, 49-1175, 49-1240, 49-1278, 49-1279, 49-1280

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		PHILCO PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6AG5	6AG5	7BD	
V2	Mixer	6AG5	6AG5	7BD	
V3	Oscillator	6J6	6J6	7BF	
V4	lst Video IF	6AG5	6AG5	7BD	
V5	2nd Video IF	6AG5	6AG5	7BD	
V6	3rd Video IF	6AG5	6AG5	7BD	
V7	4th Video IF	6AG5	6AG5	7BD	
V8	Video Det. -AGC Rect.	6AL5	6AL5	6BT	
V9	Video Amp.	12AU7	12AU7	9A	
V10	DC Restorer-2nd Sync. Amp.	7F7	7F7	8AC	
V11	lst Sound IF	6BA6	6BA6	7BK	
V12	2nd Sound IF	6AU6	6AU6	7BK	
V13	Ratio Det.	6AL5	6AL5	6BT	
V14	AF Amp.	6AU6	6AU6	7BK	
V15	Audio Output	6K6GT	6K6GT	7S	
V16	lst Sync. Amp. - Sync. Sep.	7N7	7N7	8AC	
V17	Vert. Osc.	7N7	7N7	8AC	
V18	Vert. Output	6K6GT	6K6GT	7S	
V19	Hor. Osc. -Hor. AFC	7N7	7N7	8AC	
V20	Hor. Output	6BG6G	6BG6G	5BT	
V21	Damper	5V4G	5V4G	5L	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	HV Rectifier	1B3GT	1B3GT	3C	Not usedin models 49-1040 Code 123, 49-1077 Code 122, 49-1076 Codel 123
V24	LV Rectifier	5U4G	5U4G	5T	
V25	LV Rectifier	7Z4	7Z4	5AB	
V26A	Picture Tube	10BP4	10BP4	12D	Models 49-1040 Code 123, 49-1076 Code 123, 49-1175 Code 124, 49-1150 Code 124, 49-1077 Codel 122, 49-1150 Code 122, 49-1175 Code 122
B	Picture Tube	12LP4	12LP4	12D	Models 49-1240 Code 124, 49-1278 Code 123, 49-1279 Code 122, 49-1280 Code 121

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	ERIE PART No.	SPRAGUE PART No.	
C1	30	475	30-2568-19	AFN6X		TVL-7	Filter
C2A	40	475	30-2570-8	AF862J4A		TVL-38	▲ Filter
B	10	475					■ Decoupling
C	20	475					▲ Filter
D	10	25					Hor. Output Cath. Bypass *
C3	30	250	30-2568-19	AF6F		TVL-63	Filter
C4A	10	450	30-2570-16	AF22J4A		TVL-52	▲ Filter
B	10	450					■ Low Pass Filter
C	40	50					Vert. Output Cath. Bypass
C5A	10	475	30-2570-10	AF2222X		TVL-39	▲ Sync. Amp. Decoupling
B	10	475					■ lst V. Amp. Plate Dec.
C	10	475					▲ Decoupling
D	10	475					Decoupling
C6A	10	450	45-3006	AF22J4A		TVL-52	■ Vert. Osc. Decoupling
B	10	450					▲ Vert. Amp. Decoupling
C	40	50					Output Cathode Bypass
C7	10	25	30-2417-1	E26E21		TVA-5	AGC Filter
C8	2	50	30-2417-7	E26E6		TVA-12	Stabilizing Cap.
C9	10	300	30-2417-6	PRS350/12		TVA-21	Decoupling
C10	220		62-122001001	GP220M	GP2K-220		RF Coupling
C11	470		62-147001001	GP470M	GP2K-470		AGC Filter
C12	470		62-147001001	GP470M	GP2K-470		RF Screen Bypass
C13	10		62-010009001	GP10M	GP1K-10		RF Screen Bypass
C14	470		62-147001001	GP470M	GP2K-470		RF Filament Bypass
C15	220		62-122001001	GP220M	GP2K-220		RF Coupling
C16	10		62-010009001	GP10M	GP1K-10		Mixer Screen Bypass
C17	470		62-147001001	GP470M	GP2K-470		Mixer Screen Bypass
C18	22		62-022009001	CN22JN330	N330-331-22		Osc. Grid Cap.
C19	10		62-010009001	CN10DN750	N750K-10		Osc. Grid Filter
C20	220		62-122001001	GP220M	GP2K-220		Osc. Cath. Bypass
C21	3.3		30-1221	CN3.3CNPO	NPOK-3.3		Freq. Comp.
C22	220		62-122001001	GP220M	GP2K-220		Phase Shifter
C23	470		62-147001001	GP470M	GP2K-470		AFC Filter
C24	3.3		30-1221	CN3.3CNPO	NPOK-3.3		Osc. Grid Filter ♦
C25	470		62-147001001	GP470M	GP2K-470		Decoupling
C26	470		62-147001001	GP470M	GP2K-470		Osc. Filament Bypass
C27	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	Mixer Plate Decoupling
C28	470		62-147001001	GP470M	GP2K-470	1FM-35	IF Coupling
C29	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	AGC Filter
C30	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	lst V. IF Decoupling
C31	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	Decoupling
C32	470		62-147001001	GP470M	GP2K-470	1FM-35	IF Coupling
C33	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	AGC Filter
C34	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	2nd V. IF Decoupling
C35	470		62-147001001	GP470M	GP2K-470	1FM-35	IF Coupling
C36	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	AGC Filter
C37	10		62-010009001	GP10M	GP1K-10	MS-41	2nd V. IF Decoupling ♦
C38	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	3rd V. IF Decoupling
C39	10		62-010009001	GP10M	GP1K-10	MS-41	3rd V. IF Decoupling ♦
C40	470		62-147001001	GP470M	GP2K-470	1FM-35	IF Coupling
C41	18		60-00185317	GP18K	GP1K-18		Fixed Trimmer
C42	18		60-00185317	GP18K	GP1K-18		Fixed Trimmer
C43	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	4th V. IF Cath. Bypass
C44	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	4th V. IF Decoupling
C45	470		62-147001001	GP470M	GP2K-470	1FM-35	IF Coupling
C46	100		62-110009001	GP100M	GP1K-100	1FM-31	IF Coupling
C47	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	AGC Filter
C48	56		62-056409001	CN56JN220	N220-331-56		Fixed Trimmer
C49	10		62-010009001	GP10K	GP1K-10	MS-41	V. Diode Filter
C50	.047	400	61-0122	P488-047		TM-15	Video Coupling

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C51	.22	400	45-3500-9	P488-22		TC-2	Video Coupling
C52	.5	400	45-3500-4	484-5		TC-5	Pic. Tube Cath. Bypass
C53	.047	400	45-3500-14	P488-047		TM-15	Video Coupling
C54	4000	500	45-3502	1467-004	811-005	1FM-24	Video Coupling
C55	56		62-056409001	CN56JN220	N220-331-56		Fixed Trimmer
C56	.01	100	30-1226-10	P488-01	821-01	TM-11	S. IF Coupling
C57	470		62-147001001	GP470M	GP2K-470	1FM-35	1st S. IF Cath. Bypass
C58	1500		62-215001001	GP1500M	GP2L-0015	1FM-215	Decoupling
C59	1500		62-215001001	GP1500M	GP2L-0015	1FM-215	1st S. IF Decoupling
C60	50		62-056409001	GP51M	GP1K-56	1FM-45	S. IF Coupling
C61	1500		62-215001001	GP1500M	GP2L-0015	1FM-215	2nd S. IF Decoupling
C62	1500		62-215001001	GP1500M	GP2L-0015	1FM-215	Diode Load Cap.
C63	1500		62-215001001	GP1500M	GP2L-0015	1FM-215	Diode Load Cap.
C64	100		62-110009001	GP100M	GP1K-100	1FM-31	AFC Filter
C65	.1	200	61-0113	P288-1		TM-1	AFC Filter
C66	.1	200	61-0113	P288-1		TM-1	AFC Filter
C67	.01	400	61-0120	P488-01	821-01	TM-11	Audio Coupling
C68	100		62-110009001	GP100M	GP1K-100	1FM-31	Tone Compensation
C69	.002	400	61-0062	P688-002	GP2M-002	TM-22	Tone Compensation
C70	.01	400	61-0120	P488-01	821-01	TM-11	Audio Coupling
C71	.1	400	61-0113	P488-1		TM-1	AF Amp. Screen Bypass
C72	.01	600	61-0120	P688-01	821-01	TM-11	Audio Coupling
C73	.0068	1000	61-0105	P1088-0068		MB-27	Output Plate Bypass
C74	.047	400	61-0122	P488-047		TM-15	Sync. Coupling
C75	330	500	60-10335407	1468-00035	GP2K-330	1FM-335	Sync. Coupling
C76	22	500	60-00245307	1468-000025	GP1K-22	MS-425	Sync. Sep. Grid Bypass
C77	.047	400	61-0122	P488-047		TM-15	Sync. Coupling
C78	220	500	62-122001001	1468-0002	GP2K-220	1FM-32	Sync. Amp. Grid Bypass
C79	.0022	600	61-0062	P688-0022	GP2M-0022	TM-22	Integrator Net.
C80	.0047	600	45-3502	P688-0047	811-005	TM-25	Integrator Net.
C81	.0047	600	45-3502	P688-0047	811-005	TM-25	Integrator Net.
C82	.0056	400	45-3502		GP2M-0056		Vert.Osc. Grid Cap. #
C83	.082	400	30-4651-3				Vert. Discharge §
C84	.1	400	61-0113	P488-1		TM-1	Vert. Sweep Coupling
C85	150	500	60-10155407	1468-00015	GP1K-150	1FM-315	Hor. Sync. Coupling
C86	180	500	30-1220-30	1468-0002	GP2K-180	1FM-32	Voltage Divider
C87	270	500	60-10275407	1468-00025	GP2K-270	1FM-325	Hor. Osc. Grid Cap.
C88	.0022	600	61-0062	P688-0022	GP2M-0022	TM-22	Hor. Coupling
C89	5	500	60-90505007	1468-000005	NPOK-5	MS-55	Hor. Feedback
C90	.05	400	61-0122	P488-05		TM-15	Hor. AFC Plate Bypass
C91	.25	400	61-0125	P488-25		TC-2	AFC Filter
C92	.02	400	61-0108	P488-02		TM-12	AFC Filter
C93	1500	500	60-20155404	1467-0015	GP2L-0015	1FM-215	Hor. Discharge
C94	390	500	60-10305307	1468-0004	GP2K-390	1FM-34	Hor. Sweep Coupling
C95	.082	400	30-4651-3				Damper Filter
C96	.082	400	30-4651-3				Damper Filter
C97	.5	200	61-0133	P288-5		TC-5	Hor. Sweep Coupling
C98	.1	200	61-0113	P288-1		TM-1	Bias Filter
C99	500	20000	30-1229 -2		410-500		Voltage Doubler Cap. *
C100	500	20000	30-1229 -2		410-500		HV Filter *
C101	500	20000	30-1229 -2		410-500		HV Filter
C102	.01	400	30-1226-1	P488-01	821-01	TM-11	Line Filter
C103	.01	400	30-1226-1	P488-01	821-01	TM-11	Line Filter
C104	1000	500		1468-001	GP2L-001	1FM-21	RF Bypass ♦
C105	680	500	60-10685401	1468-00075	GP2K-680	1FM-37	Hor. Output Cath. Bypass †
C106	150	500	60-10155407	1468-00015	GP2K-150	1FM-315	Vert. Amp. Plate Bypass ‡

* Used only in models 49-1040 Code 123, 49-1076 Code 123, and 49-1077 Code 122
† Used only in models 49-1076 Code 123 and 49-1077 Code 122
‡ Used only in models after 49-1040 Code 123, run 3, 49-1076 Code 123 run 1, 49-1077 code 122 run 1, 49-1040 Code 124 run 3, 49-1279 Code 122 run 3 and 49-1280 Code 121 run 3.
§ Some models use .05MFD MFGR'S Part No. 61-0122 in this application.
# Some models use .0047MFD MFGR'S Part No. 45-3502 in this application.
♦ Not used in all models.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	50KΩ	1/2	33-5563-3	B11-123 *		Horiz. hold control, panel
B	1 Meg.			B11-137 *		Vert. hold control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit"
R2A	2 Meg.	1/2	76-3964			Volume control and AC switch, tapped at 1 Meg.
B	Switch					Television-Radio switch
R2A	2 Meg.	1/2	33-5564	Q18-139X		Volume control, tapped at 1 Meg. See Note 1
B	Switch			76-1		Attach to R2A per instructions
R3A	2500Ω	2	33-5563-14			Contrast control-Wire Wound
B	250KΩ	1/2				Channel adjust control and switch
R3	5000Ω	2	33-5546-11	W-5000	43-5000	Contrast control-Wire Wound-See Note 2
R4	100KΩ	1/2	33-5539-43	Q11-128	M-49-S	Brightness control
R5	5000Ω	2	33-5546-10	W-5000	43-5000	Vert. linearity control-Wire Wound
R6	500Ω	25	33-5547 5	PR-25-500	PW-25-500	Focus control-Wire Wound
R6	200Ω	4	33-5546-13			Focus control-Wire Wound-See Note 3
R7	250KΩ	1/2	33-5539-42	Q11-130	M-55-S	Height control

* Additional parts to be used with "Concentrikit".
Note 1. Used in models 49-1150, Code 122 and 124, 49-1040 Code 123, and 49-1240 Code 124.
Note 2. Not used in models 49-1175, 49-1150 Code 124.
Note 3. Used only in models 49-1040, 1076, Code 123, 49-1077, 1175, and 49-1150 Code 122.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R8	220Ω	1/2	66-1228340		Ant. Loading
R9	220Ω	1/2	66-1228340		Ant. Loading
R10	100KΩ 20%	1/2	66-4108340		RF Grid
R11	47Ω	1/2	66-0478340		RF Cathode
R12	2700Ω	1/2	66-2278340	BTS-2700	RF Plate
R13	1000Ω	1/2	66-2108340	BTS-1000	RF Decoupling
R14	100KΩ	1/2	66-4108340		Mixer Grid
R15	56KΩ	1/2	66-3568340	BTS-56K	Mixer Screen
R16	22KΩ	1/2	66-3224340	BTS-22K	Osc. Grid
R17	220Ω	1/2	66-1228340		Osc. Cathode
R18	22KΩ	1	66-3224340	BTA-22K	Voltage Divider

RESISTORS (CONT.)

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	PHILCO PART No.	IRC PART No.	
R19	22KΩ	½	66-3224340	BTS-22K	AFC Grid
R20	560Ω	½	66-1568340	BTS-560	AFC Filter
R21	3300Ω	½	66-2338340	BTS-3300	Decoupling
R22	8200Ω	½	66-2828340	BTS-8200	1st Video IF Grid
R23	120Ω	2	66-1128340	BW-½-120	1st Video IF Cathode-Wire Wound
R24	330Ω	½	66-1334340		1st Video IF Decoupling
R25	3300Ω 20%	½	66-2338340	BTS-3300	AGC Network
R26	3300Ω 20%	½	66-2338340	BTS-3300	AGC Network
R27	5600Ω	½	66-2568340	BTS-5600	2nd Video IF Grid
R28	120Ω	2	66-1128340	BW-½-120	2nd Video IF Cathode-Wire Wound
R29	3300Ω 20%	½	66-2338340	BTS-3300	AGC Network
R30	5600Ω	½	66-2568340	BTS-5600	3rd Video IF Grid
R31	68Ω	½	66-0688340		3rd Video IF Cathode
R32	8200Ω	½	66-2828340		4th Video IF Coil Shunt-See Note 4
R33	22KΩ	½	66-3228340		Video IF Filter Network
R34	15KΩ	½	66-3158340	BTS-15K	4th Video IF Grid Coil Shunt
R35	100Ω	½	66-1108340		4th Video IF Cathode
R36	6800Ω	½	66-2688340	BTS-6800	4th Video IF Plate
R37	1000Ω	½	66-2108340	BTS-1000	4th Video IF Decoupling
R38	10KΩ	½	66-3108340	BTS-10K	AGC Network
R39	120KΩ	½	66-4128340	BTS-120K	AGC Diode Load
R40	27KΩ	½	66-3278340	BTS-27K	AGC Diode Filter
R41	47KΩ	½	66-3478340	BTS-47K	Peaking Coil Shunt
R42	3300Ω	½	66-2338340	BTS-3300	Video Det. Diode Load
R43	1 Meg. 20%	½	66-5108340	BTS-1 Meg.	Video Amp. Grid
R44	47KΩ	2	66-3478340	BTS-47K	Peaking Coil Shunt
R45	4700Ω	1	66-2475340	BTA-4700	Video Amp. Plate
R46	4700Ω	1	66-2474340	BTA-4700	Video Amp. Plate Decoupling
R47	330KΩ	½	66-4338340	BTS-330K	Video Amp. Grid
R48	47Ω	½	66-0478340	BW-½-47	Video Amp. Cathode
R49	47KΩ	½	66-3478340	BTS-47K	Peaking Coil Shunt
R50	10KΩ	½	66-3108340	BTS-10K	Video Output Plate
R51	3300Ω 5%	1	66-2338340	BTA-3300	Video Output Plate
R52	1000Ω	½	66-2108340	BTS-1000	Video Output Plate
R53	10KΩ	2	66-3108340	BT-2-10K	Low Pass Filter
R54	100KΩ 20%	½	66-4108340	BTS-100K	Voltage Divider
R55	10KΩ	½	66-3108340	BTS-10K	Phase Correction
R56	470KΩ 20%	½	66-4478340	BTS-470K	Picture Tube Grid
R57	1 Meg. 20%	½	66-5108340	BTS-1 Meg.	DC Rest. Load
R58	470KΩ 20%	½	66-4478340		1st Sound IF Grid
R59	68Ω	½	66-0688340		1st Sound IF Cathode
R60	22KΩ	½	66-3228340		1st Sound IF Transformer Shunt
R61	1000Ω	½	66-2108340	BTS-1000	1st Sound IF Decoupling
R62	330Ω	½	66-1338340		Decoupling
R63	68KΩ	½	66-3688340	BTS-68K	2nd Sound IF Grid
R64	22KΩ	½	66-3228340	BTS-22K	Voltage Divider
R65	10KΩ	1	66-3108340		2nd Sound IF Decoupling
R66	47Ω	½	66-0478340		Balancing
R67	470KΩ	½	66-4478340	BTS-470K	AFC Network
R68	470KΩ	½	66-4478340	BTS-470K	AFC Network
R69	6800Ω	½	66-2688340	BTS-6800	Balancing-See Note 15
R70	10KΩ	½	66-3108340	BTS-10K	De-emphasis
R71	6800Ω	½	66-2688340	BTS-6800	Balancing-See Note 15
R72	68KΩ	½	66-3688340	BTS-68K	Ratio Det. Diode Load
R73	68KΩ	½	66-3688340	BTS-68K	Ratio Det. Diode Load
R74	47KΩ	½	66-3478340	BTS-47K	Tone Compensation
R75	330KΩ	½	66-4338340	BTS-330K	Bias Filter-See Note 5
R76	270KΩ	½	66-4278340	BTS-270K	Voltage Divider-See Note 5
R77	15KΩ	½	66-3158340	BTS-15K	Voltage Divider-See Note 5
R78	4.7 Meg. 20%	½	66-5478340	BTS-4.7 Meg.	AF Grid
R79	560KΩ	½	66-4564340	BTS-560K	AF Screen
R80	47KΩ	½	66-3474340	BTA-47K	AF Plate
R81	1 Meg. 20%	½	66-5108340	BTS-1 Meg.	Output Grid
R82	270Ω	1	66-1274340	BW-1-270	Output Cathode-Wire Wound
R83	470KΩ 20%	½	66-4478340	BTS-470K	1st Sync. Amp. Grid
R84	10KΩ	2	66-3108340	BT-2-10K	1st Sync. Amp. Plate
R85	5100Ω	5	33-1335-18	AB-5000	Decoupling-Wire Wound
R86	10KΩ	½	66-3108340	BTS-10K	Sync. Sep. Grid
R87	4.7 Meg.	½	66-5478340	BTS-4.7 Meg.	Sync. Sep. Grid
R88	10KΩ	½	66-3108340	BTS-10K	Voltage Divider
R89	56KΩ	1	66-3564340	BTA-56K	Sync. Sep. Plate
R90	1 Meg.	½	66-5108340	BTS-1 Meg.	Voltage Divider
R91	10KΩ	½	66-3108340	BTS-10K	2nd Sync. Amp. Grid
R92	10KΩ	½	66-3108340	BTS-10K	2nd Sync. Amp. Plate
R93	3900Ω	½	66-2398340	BTS-3900	2nd Sync. Amp. Plate
R94	33KΩ	1	66-3334340	BTA-33K	2nd Sync. Amp. Plate Decoupling
R95	22KΩ	½	66-3228340	BTS-22K	Integrator
R96	8200Ω	½	66-2828340	BTS-8200	Integrator
R97	8200Ω	½	66-2828340	BTS-8200	Integrator
R98	100KΩ	1	66-4104340	BTA-100K	Vert. Osc. Plate Decoupling
R99	68KΩ	½	66-3688340	BTS-68K	Vert. Osc. Grid-See Note 6
R100	10KΩ	½	66-3108340	BTS-10K	Vert. Osc. Grid
R101	1 Meg.	½	66-5108340	BTS-1 Meg.	Voltage Divider
R102	100KΩ 20%	½	66-4108340	BTS-100K	Voltage Divider-See Note 7
R103	470KΩ	1	66-4474340	BTA-470K	Vert. Osc. Plate
R104	10KΩ	½	66-3108340	BTS-10K	Vert. Osc. Plate Decoupling
R105	470Ω	½	66-1478340		Parasitic Supp. -See Note 5
R106	2.2 Meg. 20%	½	66-5228340	BTS-2.2 Meg.	Vert. Output Grid
R107	1000Ω	1	66-2104340	BTA-1000	Vert. Output Cathode
R108	3300Ω	½	66-2338340	BTS-3300	Vert. Peaking-See Note 8
R109	68KΩ	1	66-3684340	BTA-68K	Voltage Divider
R110	220KΩ	½	66-4228340	BTS-220K	AFC Feedback
R111	10KΩ 5%	½	66-3108340	BTS-10K-5%	Horiz. Osc. Transformer Shunt
R112	68KΩ 5%	1	66-3684340	BTA-68K-5%	Horiz. Osc. Plate-See Note 9
R113	100KΩ 5%	1	66-4104340	BTA-100K-5%	Horiz. Osc. Grid
R114	100KΩ 5%	1	66-4104340	BTA-100K-5%	Voltage Divider
R115	180KΩ	½	66-4188340	BTS-180K	Horiz. AFC Filter Network
R116	3.3 Meg. 5%	1	66-5334340	BTA-3.3 Meg. 5%	Voltage Divider
R117	560KΩ	½	66-4568340	BTS-560K	Horiz. AFC Grid
R118	8200Ω	½	66-2828340	BTS-8200	Horiz. Peaking
R119	42KΩ	½	33-1343-2		Voltage Divider-Temp. Comp.
R120	82KΩ	1	66-3824340	BTA-82K	Voltage Divider
R121	10KΩ	½	66-3108340	BTS-10K	Decoupling
R122	100Ω 20%	½	66-1108340		Parasitic Supp.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA	
	RESISTANCE	WATTS	PHILCO PART No.	IRC PART No.
R123	220KΩ	½	66-4228340	BTS-220K
R124	3900Ω	2	66-2395340	BT-2-3900
R125	100Ω	5	66-1105340	AB-100
R126	100Ω	5	66-1105340	AB-100
R127	12Ω	2	66-0125340	BW-2-12
R128	12Ω	2	66-0125340	BW-2-12
R129	47KΩ	½	66-3478340	BTS-47K
R130	2 Meg.	5	33-1338	
R131	680KΩ	1	66-4684340	
R132	680KΩ	1	66-4684340	
R133	10KΩ	9	33-1336-21	AB-10,000
R134	270Ω	2	66-1274340	BW-2-270
R135	1900Ω	10	33-3435-15	AB-2000
R136	1 Meg.	1	66-5104340	BTA-1 Meg.
R137	56Ω	2	66-0565340	
R138	33Ω	½	66-0338340	BW-½-33
R139	560KΩ 5%	½	66-4568340	BTS-560K-5%
R140	4.7Ω	½	66-9478340	BW-½-4.7

Note 4. Some models use 15KΩ resistor in this application.
Note 5. Used in models 49-1150, 1175, code 124 only.
Note 6. This item changed from 10KΩ to 68KΩ in model 49-1 run 3 and models 49-1240, code 124, 49-1278, code 12
Note 7. Not used in all models.
Note 8. Added in model 49-1240, code 124, 49-1278, code 123 code 123, run 6 and models 49-1076, code 123, 49-10
Note 9. Some models use 120KΩ resistor in this application.
Note 10. Used only in models 49-1240, code 124, 49-1040 co
Note 11. Used only in model 49-1040 code 123.
Note 12. Used only in models 49-1040 code 123, 49-1076 code
Note 13. Models 49-1150, 49-1175, code 122, use 220KΩ resis
Note 14. Added in all models run 4, except models 49-1150,
Note 15. Added in all models run 2 except model 49-1150, 49

TRANSFORM

ITEM No.	RATING				PHILCO
	PRI.	SEC. 1	SEC. 2	SEC. 3	PART No.
T1	117VAC ③ 2A	710VCT .200ADC & 440VCT .090ADC	5VAC ③ 3A SEC. 4 6.3VAC ③ 9.6A	5VAC ③ 2A	32-8376

③ Drill new mounting holes.

TRANSFORMER

ITEM No.	RATING		REPLACE	
	DC RESISTANCE		PHILCO PART No.	STANCOR PART No.
	PRI.	SEC.		
T2	39Ω	98Ω	32-4367	
T3	166Ω	320Ω	32-8304-3	
T4A	280Ω Tap ③ 40Ω	SEC. 1 2.5Ω SEC. 2 0Ω SEC. 3 0Ω	32-8358	
B	280Ω Tap ③ 40Ω	SEC. 1 9.3Ω Tap ③ .9Ω SEC. 2 0Ω SEC. 3 0Ω	32-8398	
C			32-8931	
T5A	650Ω	8Ω	32-8206-1	A-8115
B	650Ω	4.4Ω	32-8306-1 ⑤	A-8115
T6A	9.5Ω		32-9604	
B	30Ω			
T7A	120Ω		76-2622-1 ⑥	
B	160Ω		76-2622-3 ⑦	

⑤ Used in models 49-1150 and 1175 code 122.
⑥ Used in models having 10" picture tube.
⑦ Used in models having 12" picture tube.

SP

ITEM No.	RATINGS		REPLACEMEN	
	FIELD	V. C. IMP.	PHILCO PART No.	JENS PART
SP1A	PM	3.7Ω	36-1610-2	ST-120 ⑥
B	PM	3.7Ω	36-1507-3 ②	ST-803
	CONE DIA.	V. C. DIA.		MOD. P5
SP2A	9 3/8"	1"		
B	5 1/8"	3/4"		

FILTER

ITEM No.	RATINGS			PHILCO PART No.
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ↶)	
L1	.200A	85Ω	5.5 Henries	32-8366
L2	.090A	153Ω	6 Henries	32-8355-1

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
R19	22kΩ	1	66-3223840	BTS-22K	AFC Grid
R20	56kΩ	1	66-1568340	BTS-560	AFC Filter
R21	4200Ω	1	66-2338340	BTS-3300	Decoupling
R22	8200Ω	1	66-2828340	BTS-8300	1st Video IF Grid
R23	120Ω	1	66-1128340	BW-1-120	1st Video IF Cathode-Wire Wound
R24	330Ω	1	66-1334340		1st Video IF Decoupling
R25	3300Ω 20%	2	66-2338940	BTS-3300	AGC Network
R26	3300Ω 20%	1	66-2338940	BTS-3300	AGC Network
R27	5600Ω	1	66-2568340	BTS-5600	2nd Video IF Grid
R28	120Ω	1	66-1128340	BW-1-120	2nd Video IF Cathode-Wire Wound
R29	3300Ω 20%	1	66-2338340	BTS-3300	AGC Network
R30	5600Ω	1	66-2568340	BTS-5600	3rd Video IF Grid
R31	68Ω	1	66-0688340		3rd Video IF Cathode
R32	8200Ω	1	66-3828340		4th Video IF Coil Shunt-See Note 4
R33	22kΩ	1	66-3228340		4th Video IF Filter Network
R34	15kΩ	1	66-3158340	BTS-15K	4th Video IF Grid Coil Shunt
R35	100Ω	1	66-1108340		4th Video IF Cathode
R36	6800Ω	1	66-2688340	BTS-6800	4th Video IF Plate
R37	1000Ω	1	66-2108340	BTS-1000	4th Video IF Decoupling
R38	100kΩ	1	66-3108340	BTS-100K	AGC Network
R39	120kΩ	1	66-4128340	BTS-120K	AGC Diode Load
R40	27kΩ	1	66-3278340	BTS-27K	AGC Diode Filter
R41	47kΩ	1	66-3478340	BTS-47K	Peaking Coil Shunt
R42	3300Ω	1	66-2338340	BTS-3300	Video Det. Diode Load
R43	1 Meg. 20%	1	66-5108340	BTS-1 Meg.	Video Amp. Grid
R44	47kΩ	1	66-3478340	BTS-47K	Peaking Coil Shunt
R45	4700Ω	1	66-2475340	BTA-4700	Video Amp. Plate
R46	4700Ω	1	66-2475340	BTS-4700	Video Amp. Plate Decoupling
R47	330kΩ	1	66-4338340	BTS-330K	Video Amp. Grid
R48	47Ω	1	66-0478340	BW-1-47	Video Amp. Cathode
R49	47kΩ	1	66-3478340	BTS-47K	Peaking Coil Shunt
R50	10kΩ	1	66-3108340	BTS-10K	Video Output Plate
R51	3300Ω 5%	1	66-2338340	BTA-3300	Video Output Plate
R52	1000Ω	1	66-2108340	BTS-1000	Video Output Plate
R53	10kΩ	2	66-3108340	BT-2-10K	Low Pass Filter
R54	100kΩ 20%	1	66-4108340	BTS-100K	Voltage Divider
R55	10kΩ	1	66-3108340	BTS-10K	Phase Correction
R56	470kΩ 20%	1	66-4478340	BTS-470K	Picture Tube Grid
R57	1 Meg. 20%	1	66-5108340	BTS-1 Meg.	DC Rest. Load
R58	470kΩ 20%	1	66-4478340		1st Sound IF Grid
R59	68Ω	1	66-0688340		1st Sound IF Cathode
R60	22kΩ	1	66-3228340		1st Sound IF Transformer Shunt
R61	1000Ω	1	66-2108340	BTS-1000	1st Sound IF Decoupling
R62	330Ω	1	66-1338340		Decoupling
R63	68kΩ	1	66-3688340	BTS-68K	2nd Sound IF Grid
R64	22kΩ	1	66-3228340	BTS-22K	Voltage Divider
R65	10kΩ	1	66-3108340		2nd Sound IF Decoupling
R66	470Ω	1	66-0478340		Balancing
R67	470kΩ	1	66-4478340	BTS-470K	AFC Network
R68	470kΩ	1	66-4478340	BTS-470K	AFC Network
R69	6800Ω	1	66-2688340	BTS-6800	Balancing-See Note 15
R70	10kΩ	1	66-3108340	BTS-10K	De-emphasis
R71	6800Ω	1	66-2688340	BTS-6800	Balancing-See Note 15
R72	68kΩ	1	66-3688340	BTS-68K	Ratio Det. Diode Load
R73	68kΩ	1	66-3688340	BTS-68K	Ratio Det. Diode Load
R74	47kΩ	1	66-3478340	BTS-47K	Tone Compensation
R75	330kΩ	1	66-4338340	BTS-330K	Bias Filter-See Note 5
R76	270kΩ	1	66-4278340	BTS-270K	Voltage Divider-See Note 5
R77	15kΩ	1	66-3158340	BTS-15K	Voltage Divider-See Note 5
R78	4.7 Meg. 20%	1	66-5478340	BTS-4.7 Meg.	A.F Grid
R79	560kΩ	1	66-4564340	BTS-560K	AF Screen
R80	47kΩ	1	66-3474340	BTA-47K	A.F Plate
R81	1 Meg. 30%	1	66-5108340	BTS-1 Meg.	Output Grid
R82	270Ω	1	66-1274340	BW-1-270	Output Cathode-Wire Wound
R83	470kΩ 20%	1	66-4478340	BTS-470K	1st Sync. Amp. Grid
R84	10kΩ	2	66-3108340	BT-2-10K	1st Sync. Amp. Plate
R85	5100Ω	5	33-1335-18	AB-5000	Decoupling-Wire Wound
R86	10kΩ	1	66-3108340	BTS-10K	Sync. Sep. Grid
R87	4.7 Meg.	1	66-5478340	BTS-4.7 Meg.	Sync. Sep. Grid
R88	10kΩ	1	66-3108340	BTS-10K	Voltage Divider
R89	56kΩ	1	66-3564340	BTA-56K	Sync. Sep. Plate
R90	1 Meg.	1	66-5108340	BTS-1 Meg.	Voltage divider
R91	10kΩ	1	66-3108340	BTS-10K	2nd Sync. Amp. Grid
R92	10kΩ	1	66-3108340	BTS-10K	2nd Sync. Amp. Plate
R93	3900Ω	1	66-2398340	BTS-3900	2nd Sync. Amp. Plate
R94	33kΩ	1	66-3334340	BTA-33K	2nd Sync. Amp. Plate Decoupling
R95	22kΩ	1	66-3228340	BTS-22K	Integrator
R96	8200Ω	1	66-2828340	BTS-8200	Integrator
R97	8200Ω	1	66-2828340	BTS-8200	Integrator
R98	100kΩ	1	66-4108340	BTA-100K	Vert. Osc. Plate Decoupling
R99	68kΩ	1	66-3688340	BTS-68K	Vert. Osc. Grid-See Note 8
R100	10kΩ	1	66-3108340	BTS-10K	Vert. Osc. Grid
R101	1 Meg.	1	66-5108340	BTS-1 Meg.	Voltage Divider
R102	100kΩ 20%	1	66-4108340	BTS-100K	Voltage Divider-See Note 7
R103	470kΩ	1	66-4474340	BTA-470K	Vert. Osc. Plate
R104	10kΩ	1	66-3108340	BTS-10K	Vert. Osc. Plate Decoupling
R105	470Ω	1	66-1478340		Parasitic Supp. -See Note 5
R106	2.2 Meg. 20%	1	66-5228340	BTS-2.2 Meg.	Vert. Output Grid
R107	1000Ω	1	66-2104340	BTA-1000	Vert. Output Cathode
R108	3300Ω	1	66-2338340	BTS-3300	Vert. Peaking-See Note 8
R109	68kΩ	1	66-3684340	BTA-68K	Voltage Divider
R110	220kΩ	1	66-4228340	BTS-220K	AFC Feedback
R111	10kΩ 5%	1	66-3108340	BTS-10K-5%	Horiz. Osc. Transformer Shunt
R112	68kΩ 5%	1	66-3684340	BTA-68K-5%	Horiz. Osc. Plate-See Note 9
R113	100kΩ 5%	1	66-4104340	BTA-100K-5%	Horiz. Osc. Grid
R114	100kΩ 5%	1	66-4104340	BTA-100K-5%	Voltage Divider
R115	180kΩ	1	66-4184340	BTS-180K	Horiz. AFC Filter Network
R116	3.3 Meg. 5%	1	66-5334340	BTA-3.3 Meg. 5%	Voltage Divider
R117	560kΩ	1	66-4568340	BTS-560K	Horiz. AFC Grid
R118	8200Ω	1	66-2828340	BTS-8200	Horiz. Peaking
R119	43kΩ	1	33-1343-2		Voltage Divider-Temp. Comp.
R120	82kΩ	1	66-3824340	BTA-82K	Voltage Divider
R121	10kΩ	1	66-3108340	BTS-10K	Decoupling
R122	100Ω 20%	1	66-1084340		Parasitic Supp.

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
R123	220kΩ	1	66-4228340	BTS-220K	Horiz. Output Grid
R124	39000Ω	2	66-2395340	BT-2-3900	Horiz. Output Screen
R125	100Ω	5	66-1105340	AB-100	Horiz. Output Cathode-Wire Wound-See Note 10
R126	100Ω	5	66-1105340	AB-100	Horiz. Output Cathode-Wire Wound-See Note 11
R127	12Ω	2	66-0125340	BW-2-12	Bias Network-Wire Wound
R128	12Ω	2	66-0125340	BW-2-12	Bias Network
R129	47kΩ	1	66-3478340	BTS-47K	Bias Filter
R130	2 Meg.	5	33-1338		HV Rect. Load-Wire Wound
R131	68.8kΩ	1	66-6884340		HV Filter-See Note 13
R132	68.8kΩ	1	66-6884340		HV Filter-See Note 12
R133	10kΩ	9	33-1336-21	AB-10,000	Decoupling-Wire Wound
R134	270Ω	2	66-1274340	BW-2-270	Filter-Wire Wound
R135	1900Ω	10	33-3435-15	AB-2000	Filter-Wire Wound
R136	1 Meg.	1	66-5104340	BTA-1 Meg.	Bleeder-See Note 13
R137	58Ω	2	66-0565340		Surge Limiter-Wire Wound
R138	33Ω	½	66-0338340	BW-½-33	Series Dial Lamp
R139	560kΩ 5%	½	66-4568340	BTS-560K-5%	Feedback
R140	4.7Ω	½	66-9478340	BW-½-4.7	Ratio Det. Filament-Wire Wound-See Note 14

Note 4. Some models use 15kΩ resistor in this application.
Note 5. Used in models 49-1150, 1175, code 124 only.
Note 6. This item changed from 10kΩ to 68kΩ in model 49-1040 Code 123, run 6, models 49-1076, code 123, 49-1077 code 122, run 3 and models 49-1240, code 124, 49-1278, code 123, 49-1279, code 122, 49-1280 code 121, run 5.
Note 7. Not used in all models.
Note 8. Added in model 49-1240, code 124, 49-1278, code 123, 49-1279, code 122, 49-1280, code 121, run 5. Model 49-1040, code 123, run 6 and models 49-1076, code 123, 49-1077, code 122 run 3.
Note 9. Some models use 120kΩ resistor in this application.
Note 10. Used only in models 49-1240, code 124, 49-1040 code 123, 49-1076 code 123, 49-1077 code 122.
Note 11. Used only in model 49-1040 code 123.
Note 12. Used only in models 49-1040 code 123, 49-1076 code 123, and 49-1077 code 122.
Note 13. Models 49-1150, 49-1175, code 122, use 220kΩ resistor in this application.
Note 14. Used in all models run 6, except models 49-1150, 49-1175 code 122 and code 124.
Note 15. Added in all models run 2 except model 49-1150, 49-1175 code 122 and code 124.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ① 2A	710VCT 200ADC ② 440VCT 090ADC	5VAC ③ 3A SEC. 4 6.3VAC ③ 9.6A	5VAC ① 2A	32-8376	P-8157 ⑤		TP-450

① Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	SEC.	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	39Ω	98Ω	32-4387				Hor. Block Osc. Trans.
T3	168Ω	320Ω	32-8304-3			TBO-1	Vert. Block Osc. Trans.
T4A	280Ω Tap ④ 40Ω	SEC. 1 2.5Ω SEC. 2 0Ω SEC. 3 0Ω	32-8358				Hor. Output Trans for 12" models and 49-1150 and 1175 code 124.
B	280Ω Tap ④ 40Ω	SEC. 1 9.3Ω SEC. 2 0Ω SEC. 3 0Ω	32-8398				Hor. Output Trans. for models 49-1150 and 1175 code 122
C			32-8931				Hor. Output Trans. for models 49-1040, 1076, 1077
T5A	650Ω	8Ω	32-8206-1	A-8115	A-3035	TSO-1	Vert. Output Trans.
B	650Ω	4.4Ω	32-8306-1 ⑥	A-8115	A-3035	TSO-1	Vert. Output Trans.
T6A	9.5Ω		32-9604				Hor. Deflection Coil
B	30Ω						
T7A	120Ω		76-2682-1 ⑥				Focus Coil
B	160Ω		76-2682-3 ⑦				Focus Coil

⑤ Used in models 49-1150 and 1175 code 122.
⑥ Used in models having 10" picture tube.
⑦ Used in models having 12" picture tube.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA PHILCO PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-120 ①		① Replace output transformer to match 8-Ω voice coil. ② Used in consolette models.
SP1A	PM	3.7Ω	36-1610-2	MOD. P10-S	10A31	
B	PM	3.7Ω	36-1507-3 ②	ST-803	52A1	
	CONE DIA.	V. C. DIA.		MOD. P525-Y		
SP2A	9 3/8"	1"				
B	5 1/8"	3/4"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~/)	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.200A	85Ω	5.5 Henries	32-8366	C-1646 ④	C-3196 ⑤	R-7200 ⑥	③ Drill new mounting holes. ④ Drill one new mounting hole.
L2	.090A	153Ω	6 Henries	32-8355-1	C-2303 ④	C-2974 ④	R-885 ④	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	MEISSNER PART No.	NOTES
L3	Ant. & RF Assy.	0Ω		32-4115		Add channel number as a suffix to part number for channel desired.
L4	Osc. & Mixer Assy.	0Ω		32-4222		Add channel number as a suffix to part number for channel desired.
L5	RF Choke	.2Ω		32-4112-2		
L6	RF Choke	.2Ω				
L7	Fil. Choke	.1Ω		32-4112-11		
L8	Fil. Choke	0Ω		32-4112-4		
L9	1st Video IF	.2Ω		32-4359-4		
L10	Fil. Choke	.1Ω		32-4112-11		
L11	RF Choke	.1Ω		32-4112-11		
L12	3rd Video IF	.2Ω		32-4359		
L13	RF Choke	.1Ω		32-4112-11		
L14	4th Video IF	.2Ω		32-4384-3		
L15	Adj. Channel Trap	8Ω		32-4234-4		
L15	5th Video IF	.2Ω		32-4333-2		
L17	6th Video IF	.2Ω		32-4234-1		
L18	Fil. Choke	.1Ω		32-4112-11		
L19	Fil. Choke	.1Ω		32-4112-11		
L20	Peaking	4.8Ω		32-4303		
L21	Sound Trap	0Ω		32-4302		
L22	Peaking	6Ω		32-4143-7		
L23	Peaking	6Ω		32-4143-7		
L24	Peaking	6Ω		32-4143-7		
L25	Peaking	5Ω		32-4143-5		
L26	Peaking	5.5Ω		32-4143-7		
L27	1st Sound IF	0Ω		32-4303		
L28	2nd Sound IF	.5Ω	.5Ω	32-4236		
L29	Ratio Det. Trans.	.1Ω	0Ω	32-4317		
L30	Fil. Choke	.1Ω		32-4112-11		
L31	Fil. Choke	.1Ω		32-4112-11		
L32	Width Cont.	3Ω		45-9527		
L33	Hor. Linearity	17.5Ω		32-4211		
L34	2nd Video IF	.2Ω		32-4359		

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M1	RF Tuner	76-3109-2	
M2	Fuse	45-2656-8	Type AGC .25A
M3	Terminal Board	76-4239	Width Cont.
M4	AVC Switch	42-1863	
M5	Ion Trap	76-3913	Permanent Magnet Type
M6	Phono-TV Switch	42-1863	Models 49-1040, 49-1240
	Cabinet	10716E	Model 49-1040
	Cabinet	10711F	Model 49-1076M
	Cabinet	10711G	Model 49-1076L
	Cabinet	10738-3	Model 49-1077
	Cabinet	10716G	Model 49-1150
	Cabinet	10738-5	Model 49-1175
	Cabinet	10716	Model 49-1240M
	Cabinet	10716A	Model 49-1240L
	Cabinet	10711M	Model 49-1278M
	Cabinet	10711N	Model 49-1278L
	Cabinet	10738	Model 49-1279
	Cabinet	10736	Model 49-1280
	Back	54-7747	Phono, Model 49-1280
	Back	54-7608	Radio, Models 49-1076, 49-1278
	Back	54-7748	Radio, Models 49-1077, 49-1279
	Back	76-4816	Radio, Model 49-1280
	Back	54-7735	TV Model 49-1040
	Back	56-5728	TV, Models 49-1076, 49-1278
	Back	54-7711-1	TV, Model 49-1077
	Back	54-7712	TV, Model 49-1240
	Back	54-7713-1	TV, Model 49-1279
	Back & Cup Assy.	76-4470	TV, Model 49-1280
	Back	54-7748	Radio, Model 49-1175
	Back	54-7735	TV, Model 49-1150
	Back	54-7733-1	TV, Model 49-1150 Code 122
	Back	54-7713-1	TV, Model 49-1175
	Knob	54-4376	Control
	Knob	54-4925-1	Hor. Hold — Mahogany
	Knob	54-4567	Vert. Hold — Mahogany
	Knob	54-4925-3	Channel Selector — Mahogany
	Knob	54-4248	Control
	Knob	54-4925-5	Hor. Hold — Blonde models 49-1278, 49-1279,
	Knob	54-4567-1	Vert. Hold — 49-1280, 49-1076, 49-1077
	Knob	56-4925-4	Channel Selector
	Knob	54-4248	Control
	Knob	54-4925-5-PCP	Hor. Hold — Blonde models 49-1150, 49-1175
	Knob	54-4567-1	Vert. Hold
	Knob	54-4925-4PCP	Channel Selector
	Safety Glass	54-7595-3	Model 49-1040, 49-1150
	Safety Glass	54-7598	Model 49-1076
	Safety Glass	54-7785	Model 49-1077
	Safety Glass	54-7848	Model 49-1175
	Safety Glass	54-7795-1	Model 49-1240
	Safety Glass	54-7609	Model 49-1278
	Safety Glass	54-7742	Model 49-1279
	Safety Glass	54-7739	Model 49-1280
	Trimmer Strip	31-6477-12	Hor. Osc. Range, Hor. Drive, Hor. Lock -In.

PHILCO MODELS 49-1040, 49-1076, 49-1077, 49-1150, 49-1175, 49-1240, 49-1278, 49-1279, 49-1280

RADIO **PARTS LIST AND DESCRIPTIONS**

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		PHILCO PART No.	STANDARD REPLACEMENT		
V27	FM RF Amp.	12AU6	12AU6	7BK	Models 49-1076 Code 123
V28	FM Converter	14F8	14F8	8BW	49-1077 Code 122
V29	AM Converter	12AU7	12AU7	9A	49-1175 Code 122
V30	1st IF Amp.	6BJ6	6BJ6	7CM	49-1175 Code 124
V31	2nd IF Amp.	6BJ6	6BJ6	7CM	49-1278 Code 123
V32	Ratio Det. -Det. - AVC-AF Amp.	19T8	19T8	9E	49-1279 Code 122
V33	Power Output	50C6G	50C6G	7AC	49-1280 Code 121

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C107A	40	250	30-2568-24	AF8842G		D-13307	▪ Filter
B	40	300					■ Filter
C	20	300					▲ Filter
D	10	300					Decoupling
C108	40	200	30-2568-28	AFN8E		TVL-3	Voltage Doubler Cap.
C109	2	50	30-2417-7	E26E6		TVA-12	Stabilizing Cap.
C110	100		62-110009001	GP100M	GP1K-100	1FM-31	Ant. Coupling
C111	100		62-110009001	GP100M	GP1K-100	1FM-31	Ant. Coupling
C112	51		30-1224-2	GP51M	GP1K-50	1FM-45	RF Coupling
C113	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Cathode Bypass
C114	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Bypass
C115	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Screen Bypass
C116	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Filament Bypass
C117	51		62-051209021	GP51M	GP1K-100	1FM-45	RF Coupling
C118	220		62-122001001	GP220M	GP2K-220	1FM-325	RF Coupling *
C119	.03	400	61-0119	P488-03		TM-13	RF Bypass †
C120	100		62-110009001	GP100M	GP1K-100	1FM-31	Mixer Cathode Bypass
C121	51		62-051209021	GP51M	GP1K-51	1FM-45	Osc. Grid Cap.
C122	220		62-122001001	GP220M	GP2K-220	1FM-325	Osc. Feedback
C123	220		62-122001001	GP220M	GP2K-220	1FM-325	Osc. Feedback
C124	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	Osc. Plate Decoupling
C125	100		62-110009001	GP100M	GP1K-100	1FM-31	FM Conv. Fil. Bypass
C126	100		62-110009001	GP100M	GP1K-100	1FM-31	FM Conv. Fil. Bypass
C127	10		62-010009001	CN10DNPO	GP1K-10	MS-41	Fixed Trimmer
C128	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Coupling
C129	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	AM Conv. Cath. Bypass
C130	220		62-122001001	GP220M	GP2K-220	1FM-325	Osc. Grid Cap.
C131	100		62-110009001	GP100M	GP1K-100	1FM-31	Osc. Feedback
C132	.01	400	61-0120	P488-01	821-01	TM-11	Tuning Cap. Isolation
C133	1500		62-215001011	GP1500M	GP2L-0015	1FM-315	RF Bypass
C134	.01	600	61-0120	P688-01	821-01	TM-11	FM Conv. Decoupling
C135	.01	600	61-0120	P688-01	821-01	TM-11	AM Conv. Decoupling
C136	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Bypass
C137	.01	400	61-0120	P488-01	821-01	TM-11	AVC Filter
C138	.01	400	61-0120	P488-01	821-01	TM-11	AVC Filter
C139	.01	400	61-0120	P488-01	821-01	TM-11	Filament Bypass †
C140	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Bypass
C141	.05	400	61-0122	P488-05		TM-15	RF Bypass
C142	.01	400	61-0120	P488-01	821-01	TM-11	Filament Bypass
C143	.004	600	61-0179	P688-004	811-005	TM-24	1st IF Decoupling
C144	.01	400	61-0120	P488-01	821-01	TM-11	2nd IF Cath. Bypass
C145	.01	400	61-0120	P488-01	821-01	TM-11	2nd IF Screen Bypass
C146	.01	600	61-0120	P688-01	821-01	TM-11	2nd IF Plate Decoupling
C147	100		62-110009001	GP100M	GP1K-100	1FM-31	2nd IF Plate Decoupling
C148	.01	400	61-0120	P488-01	821-01	TM-11	RF Bypass †
C149	.01	400	61-0120	P488-01	821-01	TM-11	Diode Load Cap.
C150	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Bypass
C151	2700	500	60-20275404	1467-0025	GP2M-0027	1FM-23	De-emphasis
C152	2.2		30-1221-4				Fixed Trimmer †
C153	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Bypass
C154	.01	400	61-0120	P488-01	821-01	TM-11	RF Bypass
C155	.03	400	45-3500-1	P488-03		TM-13	Line Isolation
C156	.05	400	61-0170	P488-05 §		72P51	Line Isolation
C157	.02	400	61-0108	P488-02		TM-12	Audio Coupling
C158	.006	400	45-3500-7	P488-006	GP2M-0056	TM-26	Tone Compensation
C159	.006	400	45-3500-7	P488-006	GP2M-0056	TM-26	Tone Compensation
C160	.006	400	45-3500-7	P488-006	GP2M-0056	TM-26	Audio Coupling
C161	51		30-1224-2	GP51M	GP1K-50	1FM-45	AF Amp. Grid Bypass †
C162	100		62-110009001	GP100M	GP1K-100	1FM-31	AF Amp. Plate Bypass
C163	.006	400	45-3500-7	P488-006	GP2M-0056	TM-26	Audio Coupling
C164	100		62-110009001	GP100M	GP1K-100	1FM-31	Output Grid Bypass
C165	220		62-122001001	GP220M	GP2K-220	1FM-325	Output Cath. Bypass †
C166	.006	600	45-3500-7	P688-006		TM-26	Output Plate Bypass
C167	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Bypass
C168	.04	400	45-3500-2	P488-04		TM-14	Line Filter
C169	.1	400		P488-1		TM-1	Phono Isolation
C170	100			GP100M	GP1K-100	1FM-31	Filament Bypass
C171	100			GP100M	GP1K-100	1FM-31	Filament Bypass †
C172	100			GP100M	GP1K-100	1FM-31	Filament Bypass †
C173	100			GP100M	GP1K-100	1FM-31	RF Bypass †
C174	100			GP100M	GP1K-100	1FM-31	FM Conv. Plate Decoupling †

* Some models use 100MMF in this application.
† Not used in all models.
‡ Some models use .02MFD in this application.
§ Wind 11 turns hook-up wire on replacement capacitor and replace in circuit as per original.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R141	2 Meg.		33-5535-17	Q18-139X	T-116	Volume control, tapped at 1 Meg.
R142	4 Meg.		33-5538-34			Tone control and switch

RADIO **PARTS LIST AND DESCRIPTIONS (Continued)**

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	PHILCO PART No.	IRC PART No.	
R143	1 Meg.	½	66-5108340	BTS-1 Meg.	FM RF Grid
R144	100Ω	½	66-1108340		FM RF Cathode
R145	15KΩ	½	66-3158340	BTS-15K	FM RF Screen
R146	10KΩ	½	66-3108340	BTS-10K	FM Conv. Grid
R147	1500Ω	½	66-2158340	BTS-1500	FM Conv. Cathode
R148	15KΩ	½	66-3158340	BTS-15K	FM Osc. Grid
R149	10KΩ	½	66-3108340	BTS-10K	FM Osc. Plate Decoupling-See Note 16
R150	68Ω	½	66-0688340	BW-½-68	Bias Network
R151	1 Meg.	½	66-5108340	BTS-1 Meg.	AM Conv. Grid
R152	1500Ω	½	66-2158340	BTS-1500	AM Conv. Cathode-See Note 17
R153	15KΩ	½	66-3158340	BTS-15K	AM Osc. Grid
R154	33KΩ	½	66-3338340	BTS-33K	AM Osc. Plate-See Note 17
R155	10KΩ	½	66-3108340	BTS-10K	FM Conv. Plate Decoupling
R156	10KΩ	½	66-3108340	BTS-10K	AM Conv. Plate Decoupling-See Note 16
R157	1 Meg.	½	66-5108340	BTS-1 Meg.	AVC Network
R158	47Ω	½	66-0478340		1st IF Cathode
R159	1000Ω	½	66-2108340	BTS-1000	1st IF Decoupling
R160	3.3 Meg.	½	66-5338340	BTS-3.3 Meg.	AVC Network
R161	68Ω	½	66-0688340		2nd IF Cathode
R162	10KΩ	½	66-3108340	BTS-10K	2nd IF Screen-See Note 16
R163	1000Ω	½	66-2108340	BTS-1000	2nd IF Plate Decoupling
R164	330KΩ	½	66-4338340	BTS-330K	Diode Load
R165	47KΩ	½	66-3478340	BTS-47K	Diode Filter
R166	47KΩ	½	66-3478340	BTS-47K	De-emphasis
R167	100KΩ	½	66-4108340	BTS-100K	AVC Network
R168	47KΩ	½	66-3478340	BTS-47K	Ratio Det. Diode Load
R169	47KΩ	½	66-3478340	BTS-47K	Tone Compensation
R170	10 Meg.	½	66-6108340	BTS-10 Meg.	AF Grid
R171	270KΩ	½	66-4278340	BTS-270K	AF Plate
R172	470KΩ	½	66-4478340	BTS-470K	Output Grid
R173	220Ω	2	66-1228340	BW-2-220	Output Cathode
R174	10KΩ	1	66-3104340	BTA-10K	Decoupling-See Note 18
R175A	1800	10	33-3435-23		Filter, Wire Wound-See Note 19
B	3180Ω	10			Filter, Wire Wound-See Note 19
R176	50Ω	7	33-1335-84		Surge Limiter, Wire Wound-See Note 20
R177	68Ω	½	66-0688340	BW-½-68	Bias Network

Note 16. Changed from 4700Ω to 10KΩ in models 49-1076, 49-1278 Code 123, 49-1077, 49-1279, Code 122 and 49-1280 Code 121, run 6.
Note 17. Changed from 2200Ω to 1500Ω in models listed in note 16 run 3
Note 18. Changed from 220Ω to 10KΩ in models listed in note 16, run 9.
Note 19. Changed from two sections of 180Ω, and 2500Ω to two sections of 180Ω and 3180Ω in models listed in note 16, run 12.
Note 20. Changed from 25Ω to 50Ω in models listed in note 16, run 4.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T9	2.7KΩ	3.7Ω	188Ω	.4Ω	32-8367	A-3849	A-2902	RO-305	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	
L34	AM Loop Ant.	0Ω		32-4273-1		
L35	FM Ant.	0Ω		32-4158-1		
L36	RF Choke	.5Ω		32-4061-2		
L37	FM RF	0Ω		32-4159-1		
L38	RF Choke	.5Ω		32-4061-2		
L39	RF Choke	.5Ω		32-4061-2		
L40	RF Choke	.5Ω				
L41	FM Osc.	0Ω		32-4018-5		
L42	AM Ant. Loading	1Ω		32-4217-1		
L43	FM RF Isolation	.5Ω		32-4061-2		
L44	AM Osc.	1Ω		32-4221-1	14-1060	
L45	RF Choke	.5Ω		32-4061-2		
L46	FM 1st IF	1Ω	1.2Ω	32-4257		
L47	AM 1 st IF	23Ω	20Ω	32-4258		
L48	FM 2nd IF	1Ω	1Ω	32-4257-1		
L49	AM 2nd IF	0Ω	9.8Ω	32-4160-3	16-6678	
L50	Ratio Det. Trans.	1.5Ω	.1Ω	32-4261		
L51	3rd AM IF	14.5Ω	14.5Ω	32-4240-1	16-6678	
L52	Fil. Choke	1.5Ω		32-4143-4		
L53	RF Choke	.5Ω		32-4061-2		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					PHILCO PART No.		
M7	Bayonet	6-8	.15	Brown	34-2068		Type #47
M8	Screw	120V			34-2605		Type 120V, 7W
M9	Screw	120V			34-2605		Type 120V, 7W

M8 and M9 not used in all models, 49-1040 Code 123, 49-1150 Code 122, 49-1240 Code 124, 49-1150 Code 124

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	PHILCO PART No.	SYLVANIA PART No.		
M10	.105A	34-8003-2	ND-5		
M11	.105A	34-8003-2	ND-5		

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA					REMARKS
	PHILCO PART No.	ASTATIC PART No.		SHURE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M12	35-2671-1	LT2-M	T(M)	W61B	A62A	
M13	45-1609	U-J	U(J)			

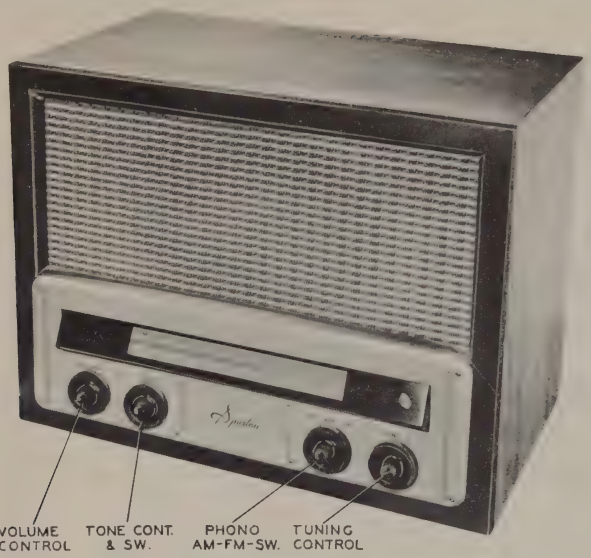
MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M14	STD-LP Switch		
M15	Tuning Cap.	31-2724-7	(23-522MMF) (10-247MMF) W/T
M16	Switch	42-1874	FM-AM-Phono

PHILCO MODELS 49-1040, 49-1076, 49-1077, 49-1150, 49-1175, 49-1240, 49-1278, 49-1279, 49-1280

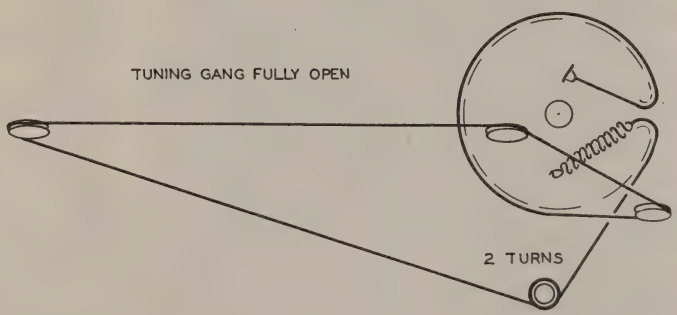
DIAL CORD STRINGING

SPARTON MODELS 141A,
(Ch. 8L10), 4970, 4971, 4972, (Ch. 8S10)



SPARTON MODEL 141A

TRADE NAME	Sparton Models 141A (Ch. 8L10), 4970, 4971, 4972 (Ch. 8S10)		
MANUFACTURER	Sparks-Withington Co., Jackson, Michigan		
TYPE SET	AC Operated AM-FM Superheterodyne Receiver with Loop Antenna		
TUBES(EIGHT)	Types 12AT7 FM RF Amp.-FM Mixer, 6BE6 FM Osc.-AM Converter, 6BA6 1st IF Amp., 6BA6 FM 2nd IF Amp., 6AL5 Ratio Det., 6AV6 DET-AVC-AF, 6V6GT Power Output, 5Y3GT Rectifier		
POWER SUPPLY	110-120 Volts AC	RATING	.55 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	540-1610KC	FREQ. MOD.	88-108MC



DIAL CORD DRIVE

HOWARD W. SAMS & CO., INC. • Indianapolis 1, Indiana

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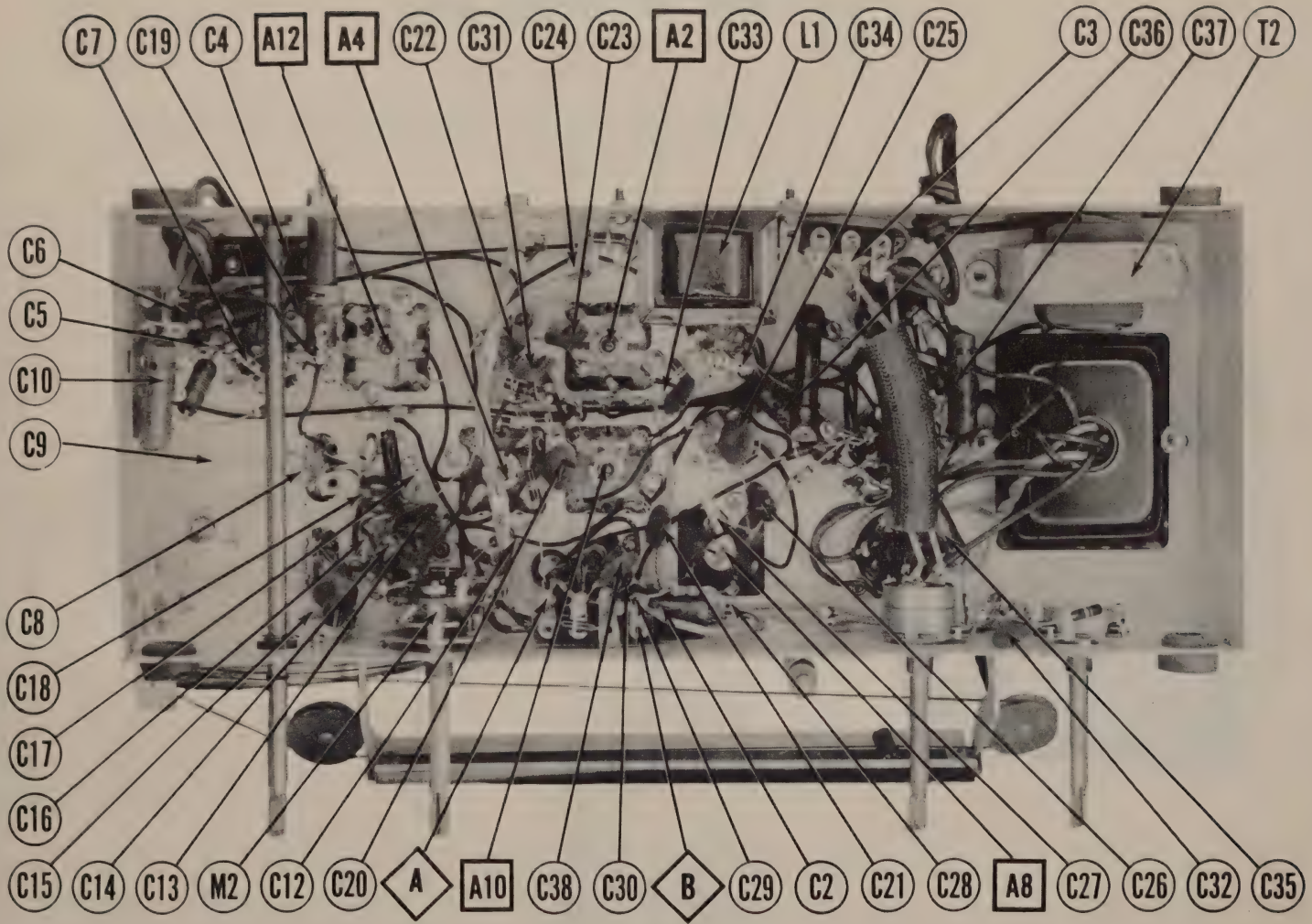
C7
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C4
A12
A4
C22
C31
C24
C23
A2
C33
L1
C34
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C37
T2
C6
C5
C10
C9
C8
C18
C17
C16
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C14
C13
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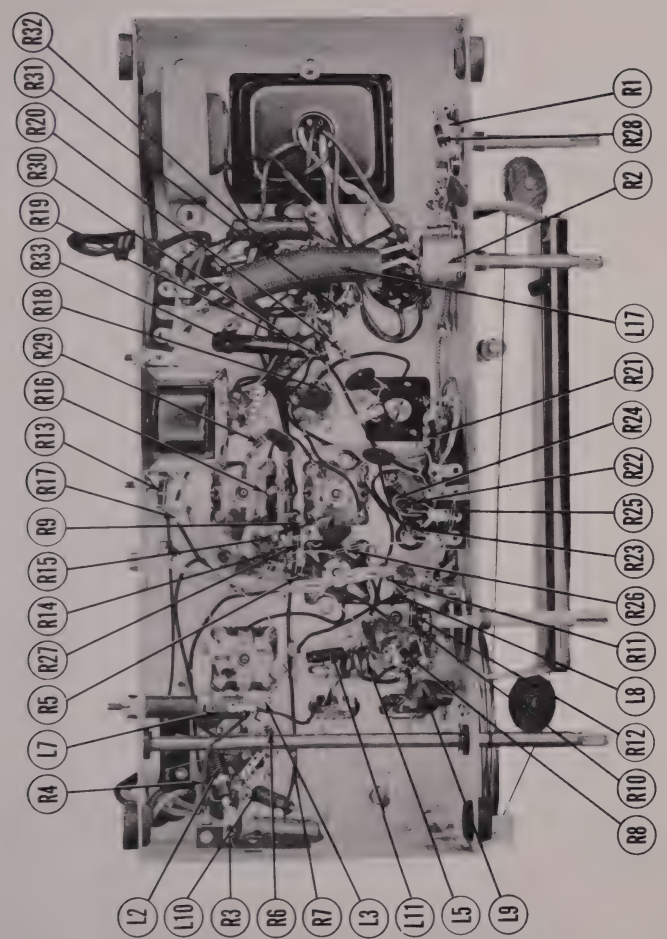
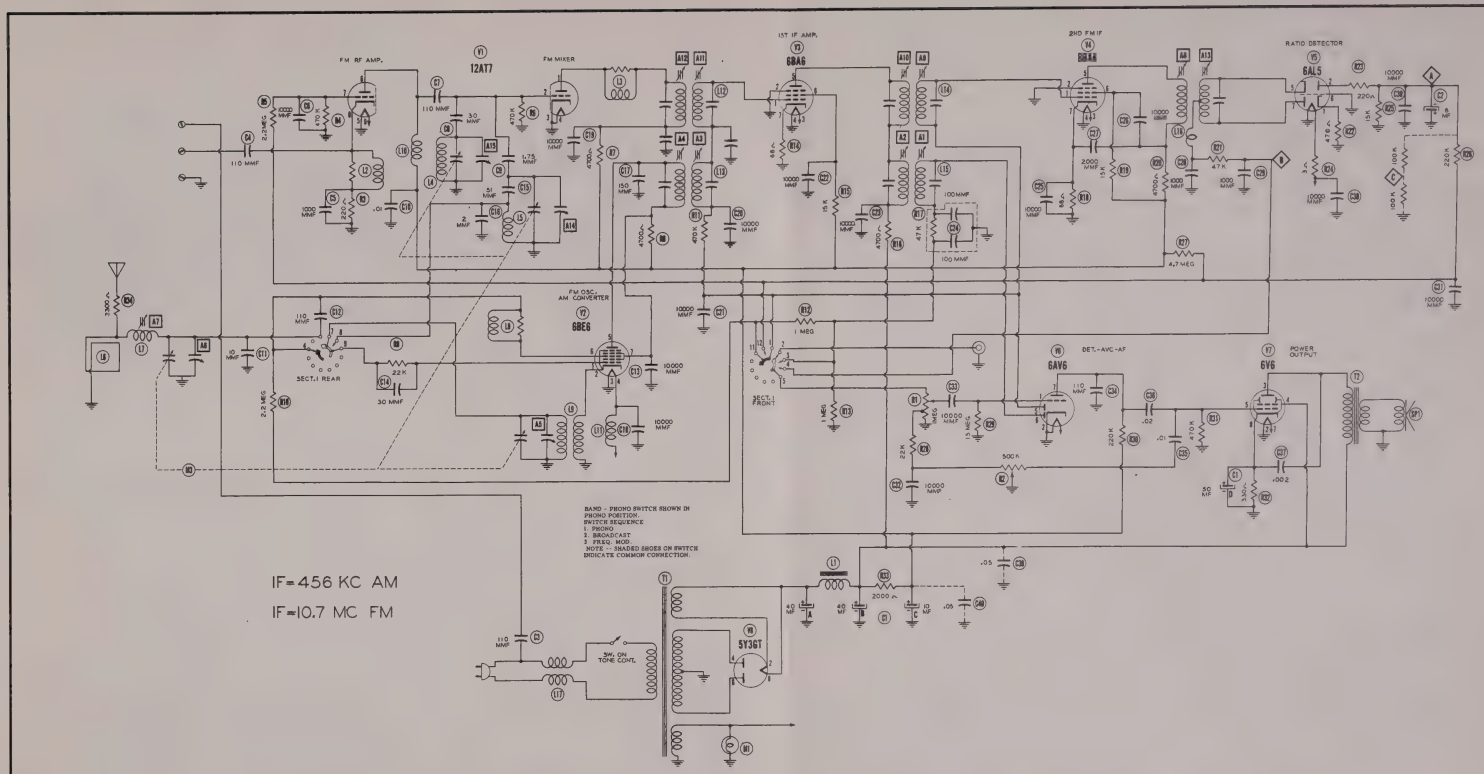
C35





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7	185VDC	-.4VDC	0V.	0V.	0V.	185VDC	0V.	1.8VDC	6.3VAC
V2	6BA6	1-2VDC	0V.	0V.	6.3VAC	105VDC	105VDC	-.7VDC		
V3	6BA6	1-7.2VDC	0V.	0V.	6.3VAC	105VDC	105VDC	-.8VDC		
V3	6BA6	-.2VDC	0V.	6.3VAC	0V.	185VDC	185VDC	-VDC		
V4	6BA6	-.1VDC	0V.	6.3VAC	0V.	104VDC	85VDC	-.8VDC		
V5	6AL5	.1VDC	-.8VDC	5.8VAC	0V.	-.5VDC	0V.	-.1VDC		
V6	6AV6	-.5VDC	0V.	6.3VAC	0V.	-.6VDC	-.5VDC	85VDC		
V7	6V6GT	0V.	0V.	215VDC	325VDC	0V.	185VDC	6.3VAC	1EVDC	
V8	5Y3GT	0V.	350VDC	0V.	350VAC	0V.	335VAC	0V.	350VDC	

‡ TAKEN WITH VACUUM TUBE VOLTMETER.
† TAKEN IN "FM" POSITION.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7	975Ω	470KΩ	0Ω	0Ω	0Ω	12. MEG	470KΩ	330Ω	2Ω
V2	6BA6	330Ω	1Ω	0Ω	1Ω	175Ω	175Ω	6 Meg.		
V3	6BA6	3 Meg.	0Ω	1Ω	0Ω	150Ω	128Ω	68Ω		
V4	6BA6	390KΩ	0Ω	1Ω	0Ω	175Ω	117Ω	68Ω		
V5	6AL5	470Ω	18Ω	0Ω	0Ω	1 Meg.	0Ω	1 Meg.		
V6	6AV6	10 Meg.	0Ω	1Ω	0Ω	550KΩ	1.5 Meg.	1250KΩ		
V7	6V6GT	0Ω	0Ω	175Ω	1250Ω	470KΩ	12.4KΩ	1Ω	330Ω	
V8	5Y3GT	0Ω	300KΩ	Inf.	95Ω	Inf.	85Ω	Inf.	220KΩ	

† MEASURED FROM PIN 8 OF V5.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial indicator: turn tuning gang fully closed and set the indicator even with the last reference mark at the low frequency end of the dial scale.

AM ALIGNMENT

Loop should be maintained in the same relative position in chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output signal generator should be no higher than necessary to obtain an output reading. Use shielded alignment screwdriver for adjustments.

		SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	02 MFD	DUMMY ANTENNA						
	02 MFD	High side to pin 7 (grid of 6BE6 (Y3). Low side to chassis.	455KC (450% kcd.)	AM (Center position)	Turn to first fully open	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output.
2.		Loop	1500KC	"	"	"	A5, A6	Position loop at several turns from position in cabinet. Rotate loop of receiver. Adjust for maximum output.
3.		"	600KC	"	"	"	A7	
								Adjust for maximum output. Repeat steps 2 and 3 until no further improvement can be made.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 200KΩ (+5%) resistors in series from point ◇ to chassis. The junction of these two resistors is alignment point C as shown on the schematic.

		SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	BAND DIAL SETTING	VTVM CONNECT	ADJUST	REMARKS
4.	02 MFD	DUMMY ANTENNA						
	02 MFD	High side to pin 5 (grid of 6BA6 (Y2)). Low side to chassis.	10.7MC	FM	Between 88 & 89 (Unmod.)	DC Probe ◇ to point C. Common to chassis.	A8, A9	Adjust for maximum deflection.
5.	02 MFD	"	"	"	"	"	A10	
6.	02 MFD	High side to pin 5 (grid of 6BA6 (Y2)). Low side to chassis.	10.7MC	FM	Between 88 & 89 (Unmod.)	DC Probe ◇ to point C. Common to chassis.	A11, A12	

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 25% modulation and 455KC sweep. Use 100K sawtooth voltage in scope for horizontal deflection.

		SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	BAND DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
4.	02 MFD	DUMMY ANTENNA						
	02 MFD	High side to pin 5 (grid of 6BA6 (Y2)). Low side to chassis.	10.7MC	FM	Between 88 & 89 (Unmod.)	DC Probe ◇ to point C. Common to chassis.	A8, A9	Disconnect stabilizer capacitor C2. Adjust for maximum amplitude and symmetry as per figure 1.
5.	02 MFD	"	"	"	"	"	A10	
6.	02 MFD	High side to pin 5 (grid of 6BA6 (Y2)). Low side to chassis.	10.7MC	FM	Between 88 & 89 (Unmod.)	DC Probe ◇ to point C. Common to chassis.	A11, A12	

The signal generator output lead should terminate with its characteristic impedance, usually 50 ohms.

		SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	BAND DIAL SETTING	VTVM CONNECT	ADJUST	REMARKS
7.		DUMMY ANTENNA						
	Two 120Ω (Across antenna terminals on tuner head) resistors in each lead	SIGNAL GENERATOR COUPLING (Across antenna terminals on tuner head)	1000KC (Unmod)	FM	Between 88 & 89 (Unmod.)	DC Probe ◇ to point C. Common to chassis.	A13	Disconnect stabilizer capacitor C2. Adjust A13 so 10.7MC marker lines are per figure 2. SLIGHTLY retouch A8 for maximum amplitude and symmetry of crossover lines.
8.		"	"	"	"	"	A14, A15	Adjust for maximum deflection.

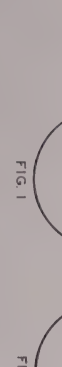


FIG. 1

FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	FM RF Amp. - FM Mixer	12AT7	12AT7	9A	
V2	FM Osc. - AM Converter	6BE6	6BE6	7CH	
V3	1st IF Amplifier	6BA6	6BA6	7BK	
V4	2nd FM IF Amp.	6BA6	6BA6	7BK	
V5	Ratio Detector	6AL5	6AL5	6BT	
V6	Det. -AVC -AF	6AV6	6AV6	7BT	
V7	Power Output	6V6GT	6V6GT	7AC	
V8	Rectifier	5Y3GT	5Y3GT	5T	

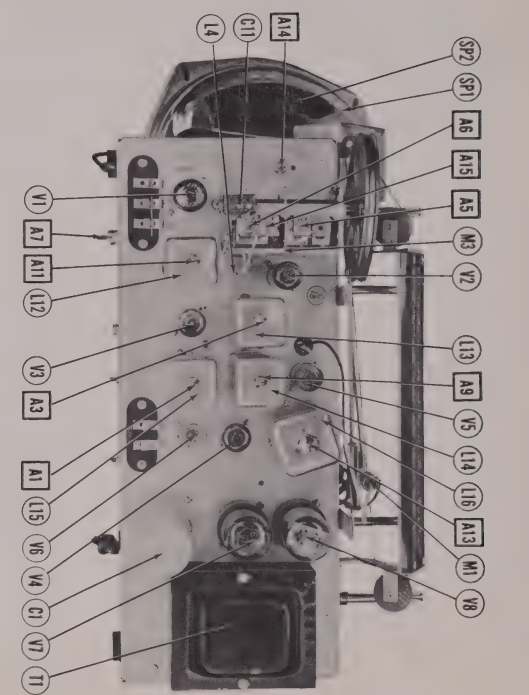
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	80	450	PA4307-4	AFH8822G10B		TVL-30	■ Filter - See note 1.
B	40	450					▲ Filter
C	10	500					● Filter
D	20	50					◆ Output Cathode Bypass
C1A	40	400	PA4307-3	AF8824A		KL-424 ◆	■ Filter - See note 2
B	40	400					■ Filter
D	20	25					▲ Output Cathode Bypass
C1C	8	400	PA4303-4	PRS450/8		UT-8	Filter - See note 2
C2	5	50	PA4303-7	PRS50/10		ZA-510	Stabilizing Capacitor
C3	110		CC30H-111A	GP120M	GP2K-120	1FM-31	Line Antenna Coupling
C4	110		CC30H-111A	GP120M	GP2K-120	1FM-31	Antenna Coupling
C5	1000		HK35G-102	GP1000M	GP2L-001	1FM-21	FM RF Cathode Bypass
C6	10000		PA4334-2	BPD-10	821-01	36C1	AVC Filter
C7	110		CC30H-111A	GP120M	GP2K-120	1FM-31	RF Coupling
C8	30		CC30H-300K	GP30K	GP1K-33	MS-43	RF Coupling - See note 3.
C9	1.75		PA4344				Oscillator Coupling - See note 4.
C10	.01	400	PC40EL-103	P488-01	821-01	TM-11	Decoupling
C11	10	500	MC60F-100	1469-00005	NPOK-10	MS-41	Fixed Trimmer
C12	110		CC30H-111A	GP120M	GP2K-120	1FM-31	RF Coupling
C13	10000		PA4334-2	BPD-10	821-01	36C1	Converter Decoupling
C14	30		CC30H-300K	GP30K	GP1K-33	MS-43	Oscillator Grid Capacitor
C15	5b		CC30A-510K	CN51JNPO	NPOM-50	MS-45	Fixed Padder
C16	2		CC30H-020K	CN2CN750	N750K-2		Fixed Trimmer
C17	150		CC30G-151F	CN150J2N470	N470L-150	MS-315	Fixed Trimmer
C18	10000		PA4334-2	BPD-10	821-01	36C1	Converter Filament Bypass
C19	10000		PA4334-2	BPD-10	821-01	36C1	Mixer Plate Decoupling
C20	10000		PA4334-2	BPD-10	821-01	36C1	AVC Filter
C21	10000		PA4334-2	BPD-10	821-01	36C1	AVC Filter
C22	10000		PA4334-2	BPD-10	821-01	36C1	1st IF Screen Bypass
C23	10000		PA4334-2	BPD-10	821-01	36C1	1st IF Plate Bypass
C24A	100		#	GP100M	GP1K-100	1FM-31	Diode RF Filter
B	100			GP100M	GP1K-100	1FM-31	Diode RF Filter
C25	10000		PA4334-2	BPD-10	821-01	36C1	2nd IF Cathode Bypass
C26	10000		PA4334-2	BPD410	821-01	36C1	2nd IF Screen Bypass
C27	2000		HK35E-202	GP2000M	GP2M- 002	1FM-22	2nd IF Plate Decoupling
C28	1000		HK35C-102	GP1000M	GP2L-001	1FM-21	Diode Load Capacitor
C29	1000		HK35C-102	GP1000M	GP2L-001	1FM-21	De - emphasis
C30	10000		PA4334-2	BPD-10	821-01	36C1	RF Bypass
C31	10000		PA4334-2	BPD-10	821-01	36C1	AVC Filter
C32	10000		PA4334-2	BPD-10	821-01	36C1	Tone Compensation
C33	10000		PA4334-2	BPD-10	821-01	36C1	Audio Coupling
C34	110		CC30H-111A	GP120M	GP2K-120	1FM-31	AF Amplifier Plate Bypass
C35	.01	400	PC40EL-103	P488-01	821-01	TM-11	Tone Compensation
C36	.02	400	PC40EL-203	P488-03		TM-12	Audio Coupling
C37	.002	1000	PC40GN-202	P1088-002		MB-22	Output Plate Bypass
C38	10000		PA4334-2	BPD-10	821-01	36C1	Filament Bypass
C39	.05	600	PC40HM-503	P688-05		TM-15	RF Bypass - See note 2.
C40	.05	600	PC40HM-503	P688-05		TM-15	RF Bypass - See note 2.

NOTE 1 - Used only in chassis 8L10.
NOTE 2 - Used only in chassis 8S10.
NOTE 3 - Chassis 8S10 uses 130MMF in this application (Mfgrs Part No. CC30H-131A)
NOTE 4 - Chassis 8S10 uses 2MMF in this application (Mfgrs. Part No. CC30A-020K)
Items C24A, C24B and R17 are combined into one unit obtainable under Mfgrs. Part No. PA4329-1.
◆ Parallel sections to obtain desired capacity.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	PA4408-2	Q18-137X	AT-103	Volume Control - Tapped at 100KΩ
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R1A per instructions.
R2A	500KΩ	½	PA4400-10	Q13-133	AM-60-Z	Tone Control
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R2A per instructions.
C	Switch		Not Req.	78-1	SW-A	Attach to R2A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R3	220Ω	½	BR2S-221		FM RF Cathode
R4	470KΩ	½	BR2S-474	BTS-470K	FM RF Grid
R5	2.2 Meg.	½	BR2S-225	BTS-2.2Meg.	AVC Network
R6	470KΩ	½	BR2S-474	BTS-470K	FM Mixer Grid
R7	4700Ω	½	BR2S-472	BTS-4700	FM Mixer Plate Decoupling
R8	22KΩ	½	BR2S-223	BTS-22K	Oscillator Grid
R9	4700Ω	½	BR2S-472	BTS-4700	AM Converter Plate Decoupling
R10	2.2Meg.	½	BR2S-225	BTS-2.2 Meg.	AVC Network
R11	470KΩ	½	BR2S-474	BTS-470KΩ	AVC Network
R12	1 Meg.	½	BR2S-105	BTS-1 Meg.	AVC Network
R13	1 Meg.	½	BR2S-105	BTS-1 Meg.	Diode Load
R14	68Ω	½	BR2S-680		1st IF Cathode
R15	15KΩ	½	BR2S-153	BTS-15K	1st IF Screen
R16	4700Ω	½	BR2S-472	BTS-4700	1st IF Plate Decoupling
R17	47KΩ	½	#	BTS-47K	Diode Filter
R18	68Ω	½	BR2S-680		2nd FM IF Cathode
R19	15KΩ	½	BR2S-153	BTS-15K	2nd FM IF Screen
R20	4700Ω	½	BR2S-472	BTS-4700	2nd FM IF Plate Decoupling
R21	47KΩ	½	BR2S-473	BTS-47K	De - emphasis
R22	470Ω	½	BR2S-471	BTS-470	Balancing
R23	220Ω	½	BR2S-221		Balancing
R24	9Ω	1	PA4307-1		Ratio Detector Filament - Wire Wound
R25	15KΩ	½	BR2S-153	BTS-15K	Ratio Detector Diode Load
R26	220KΩ	½	BR2S-224	BTS-220K	AVC Network
R27	4.7 Meg.	½	BR2S-475	BTS-4.7Meg.	Delayed AVC
R28	22KΩ	½	BR2S-223	BTS-22K	Tone Compensation
R29	15 Meg.	½	BR2S-156	BTS-15 Meg.	AF Amplifier Grid
R30	220KΩ	½	BR2S-224	BTS-220KΩ	AF Amplifier Plate
R31	470KΩ	1	BR2S-474	BTS-470K	Output Grid
R32	330Ω	1	CR2S-331	BTA-330	Output Cathode
R33	2000Ω	10	PA4200-10	AB-2000	Filter - Wire Wound
R34	330Ω	½	BR2S-332	BTS-3300	Antenna Loading

Items C24A, C24B and R17 are combined into one unit, obtainable under Mfgrs. Part No. PA4329-1.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC @ 55 Amp.	540 Volts @ .085ADC	5VAC @ 2 Amp.	6.3VAC @3.56 A.	AB-44013-1	P-8312 *	P-2952 *	PH-70 *

* Drill new mounting holes and add series resistor to reduce plate voltage.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T2	6.5KΩ	4.1Ω	384Ω	.44Ω	AB-44081-2	A-3849	A-3019	RO-13	

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS: FIELD	RATINGS: V.C. IMP.	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: VIKING PART No.	REPLACEMENT DATA: QUAM PART No.	INSTALLATION NOTES
	PM	4.1Ω				
SP1	CONE DIA.	V.C. DIA.	PC-63000-19	6919	69A2	
SP2	6 1/8" x 9"	1"				

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE @ CURRENT 1000 ~cl	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
L1	.083ADC	320Ω	5.9 Henries	AB-47004-1		C-2975		

R F COILS

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: MEISSNER PART No.	
L2	FM Ant. Coil	.2Ω		AA6798-3		
L3	Parasitic Supp.	0Ω		AA6798-7		Wound on 820Ω resistor.
L4	FM RF Coil	0Ω		PA5200-6		
L5	FM Osc. Coil	0Ω		PA5200-7		
L6	Loop Antenna	.5Ω		PA5250-4		
L7	Ant. Loading	2.2Ω		AA6816-1		
L8	Parasitic Supp.	0Ω		AA6798-5		Wound on 22Ω resistor.
L9	AM Oscillator	1Ω	6.2Ω	AA6665-3	14-1073	
L10	RF Choke	0Ω		AA6769-2		
L11	Filament Choke	0Ω		AA6798-8		
L12	1st FM IF	.3Ω	.5Ω	AA6687-1		
L13	1st AM IF	12Ω	12Ω	AA6688-5	16-6666	
L14	2nd FM IF	.5Ω	.5Ω	AA6667-3		
L15	2nd AM IF	12.9Ω	12.9Ω	AA6668-1	16-6667	
L16	Ratio Det. Tran	2.2Ω	1.3Ω	AA6684-1		
L17	AC Line Choke	.1Ω		AA6664-1		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: SPARTON PART No.	NOTES
M1	Bayonet	6 - 8	.250	Blue	PA4100-3	Type #44

MISCELLANEOUS

ITEM No.	PART NAME	SPARTON PART No.	NOTES
M2	Switch	PA 4610	Band - Phono
M3	2 Gang Variable Cap.	PC 65002-1	(25 - 534MMF, 37 - 247MMF)
A14	Trimmer	PA4368	FM Oscillator Adjustment

SET 92
FOLDER 6

PHOTOFACT* Folder

STARRETT MODELS
HENRY HUDSON, HENRY PARKS,
ROBERT E. LEE

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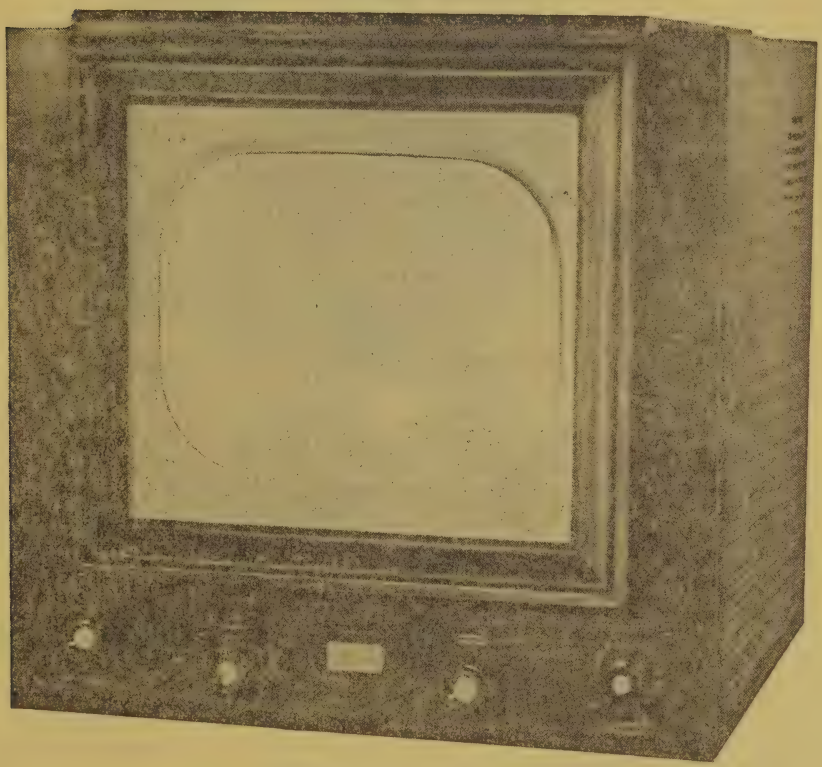

MODEL "HENRY HUDSON"

STARRETT MODELS
HENRY HUDSON, HENRY PARKS,
ROBERT E. LEE

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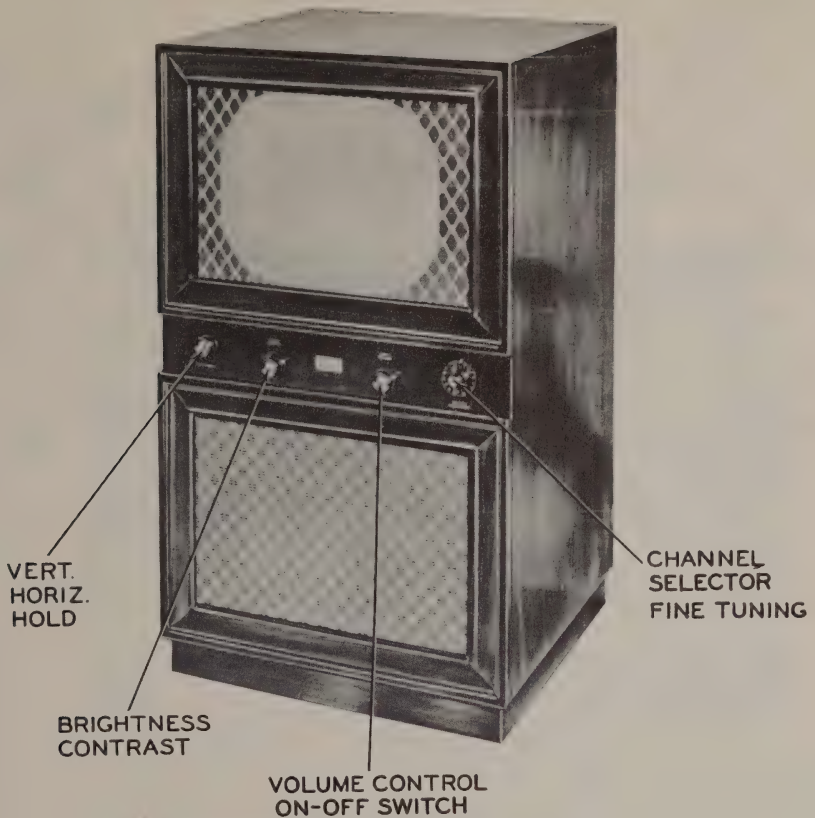

STARRETT MODELS "HENRY HUDSON," "HENRY PARKS," "ROBERT E. LEE"

STARRETT MODEL "HENRY PARKS"

TRADE NAME	Starrett Models "Henry Hudson","Henry Parks", "Robert E. Lee".
SUPPLIER	Starrett Television Corp., 601 W. 25th St., New York, New York
TYPE SET	Television Receiver
TUBES	Twenty Two

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 2.05 Amp. at 117 Volts AC
TUNING RANGE—Channels 2 thru 13

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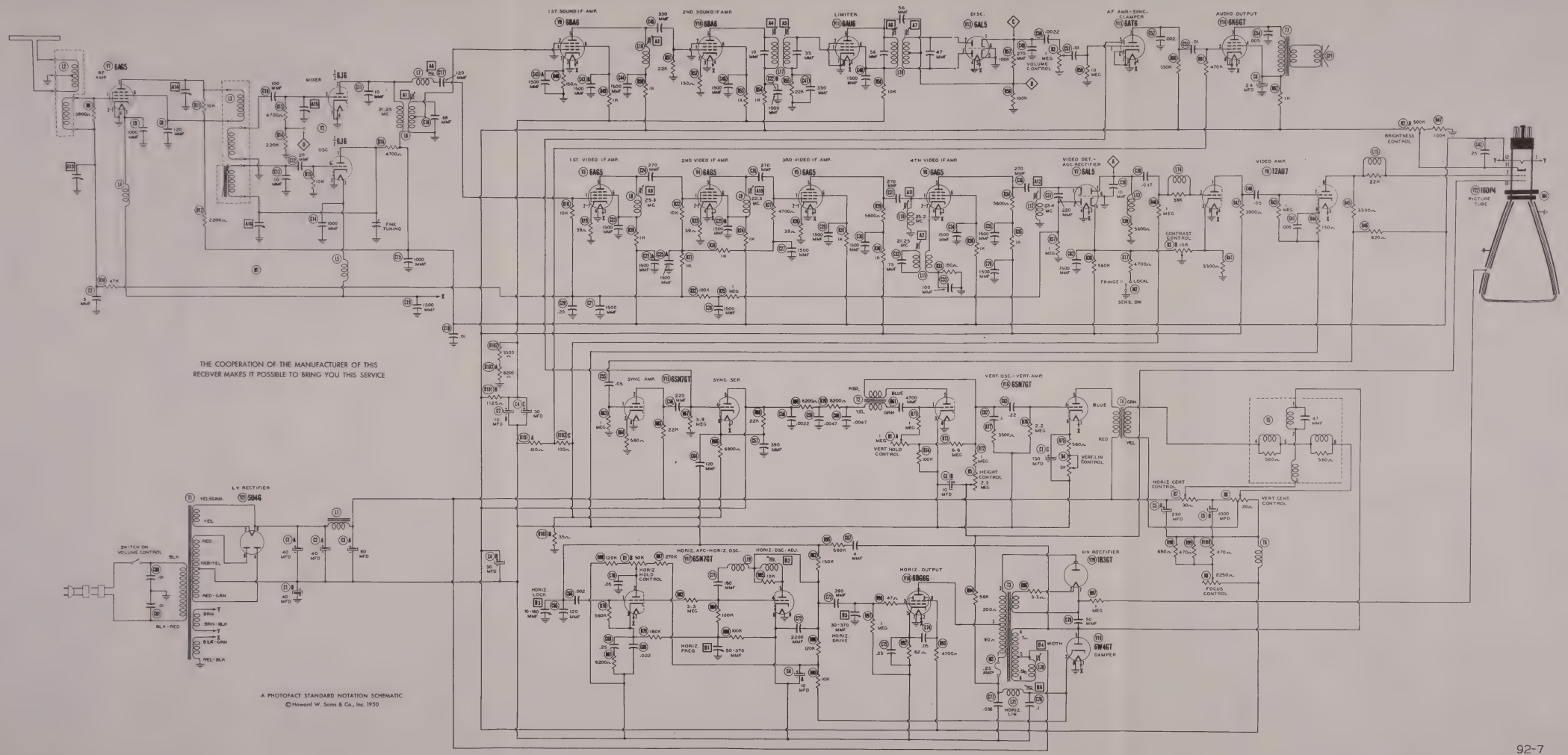
1ST SOUND IF AMP.
2ND SOUND IF AMP.
LIMITER
DISC.
AF AMP.-SYNC.-CLAMPER
AUDIO OUTPUT
1ST VIDEO IF AMP.
2ND VIDEO IF AMP.
3RD VIDEO IF AMP.
4TH VIDEO IF AMP.
VIDEO DET.-AGC RECTIFIER
VIDEO AMP.
BRIGHTNESS CONTROL
PICTURE TUBE
RF AMP.
MIXER
OSC.
FINE TUNING
SYNC. AMP.
SYNC. SEP.
VERT. OSC.-VERT. AMP.
VERT. HOLD CONTROL
HEIGHT CONTROL
VERT. LIN CONTROL
CONTRAST CONTROL
FRINGE
LOCAL
SENS. SW.
HORIZ. CENT. CONTROL
VERT. CENT. CONTROL
FOCUS CONTROL
HORIZ. AFC-HORIZ. OSC.
HORIZ. OSC. ADJ.
HORIZ. OUTPUT
HV RECTIFIER
DAMPER
HORIZ. HOLD CONTROL
HORIZ. FREQ.
HORIZ. DRIVE
HORIZ. LIN.
WIDTH
LV RECTIFIER
SWITCH ON VOLUME CONTROL
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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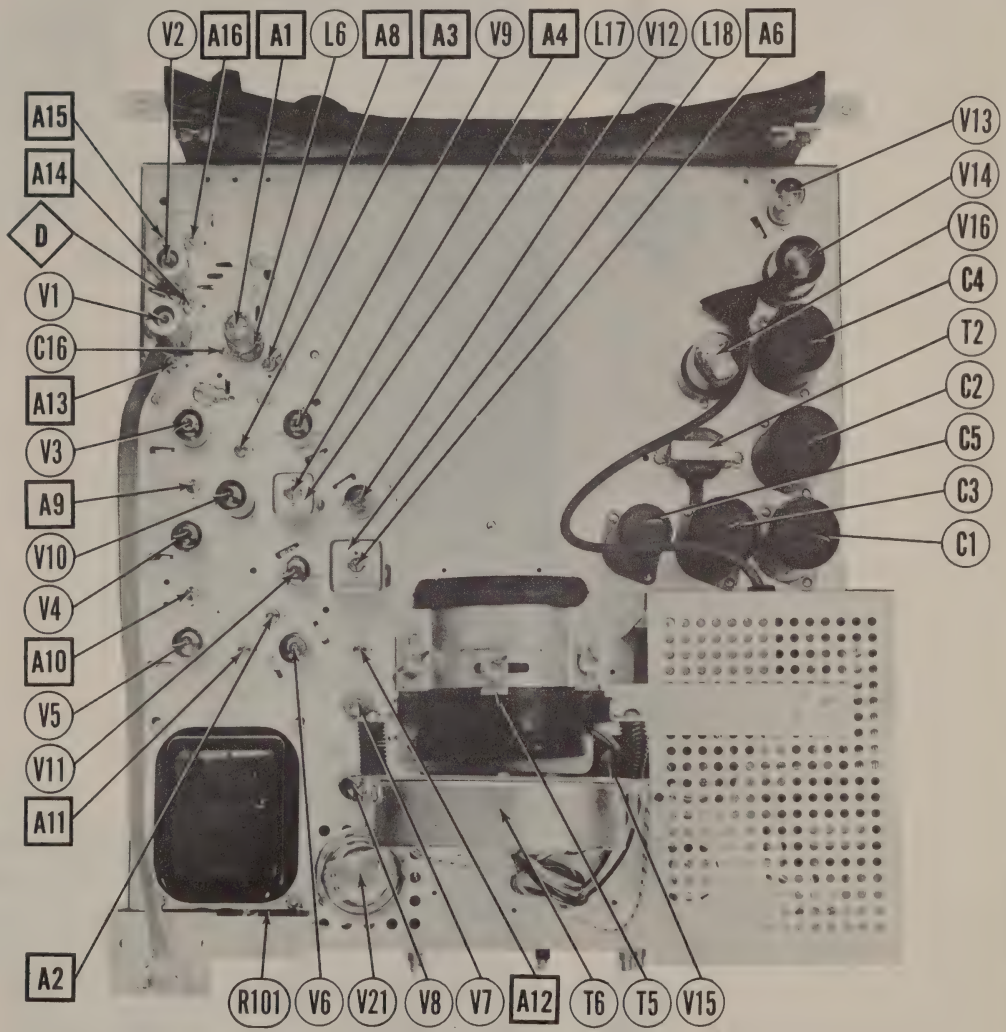
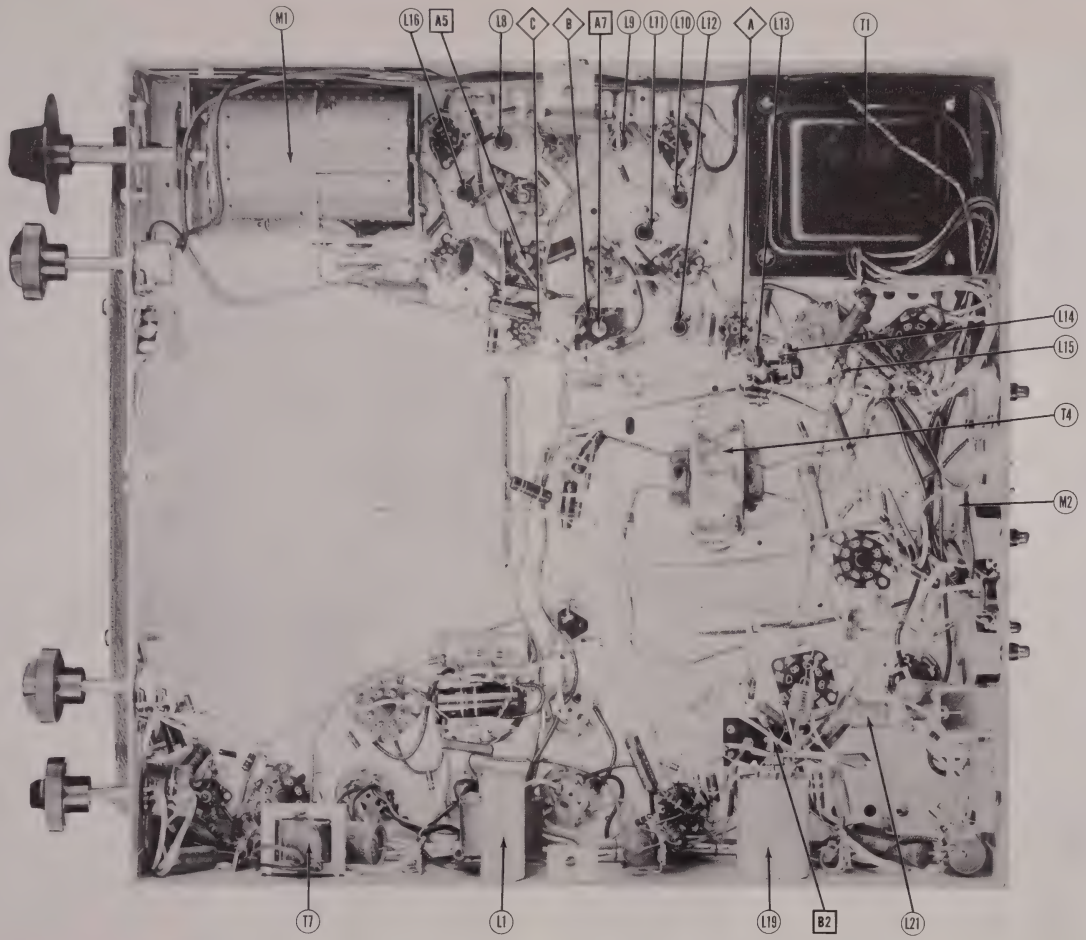
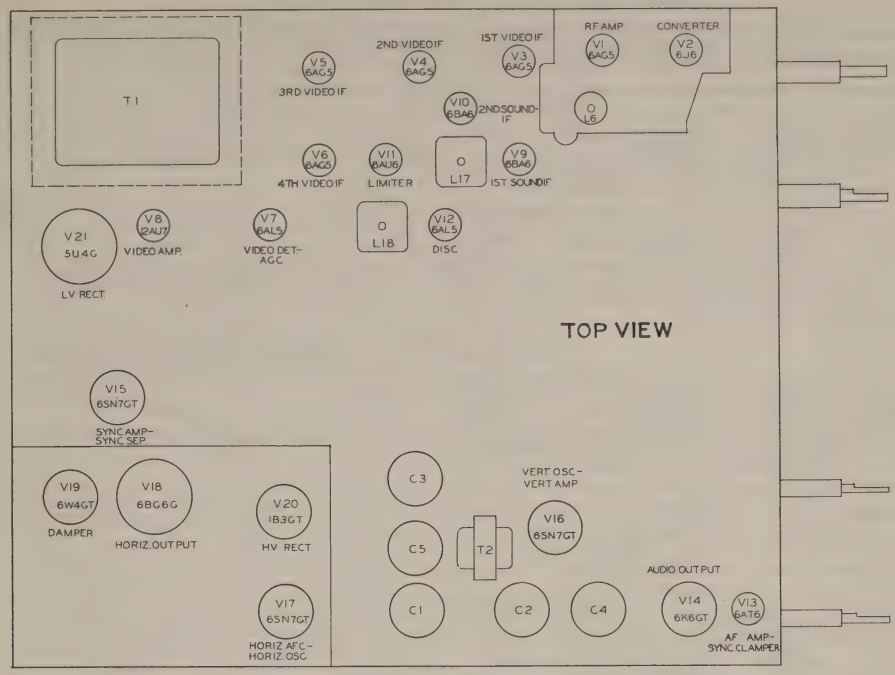
92-7

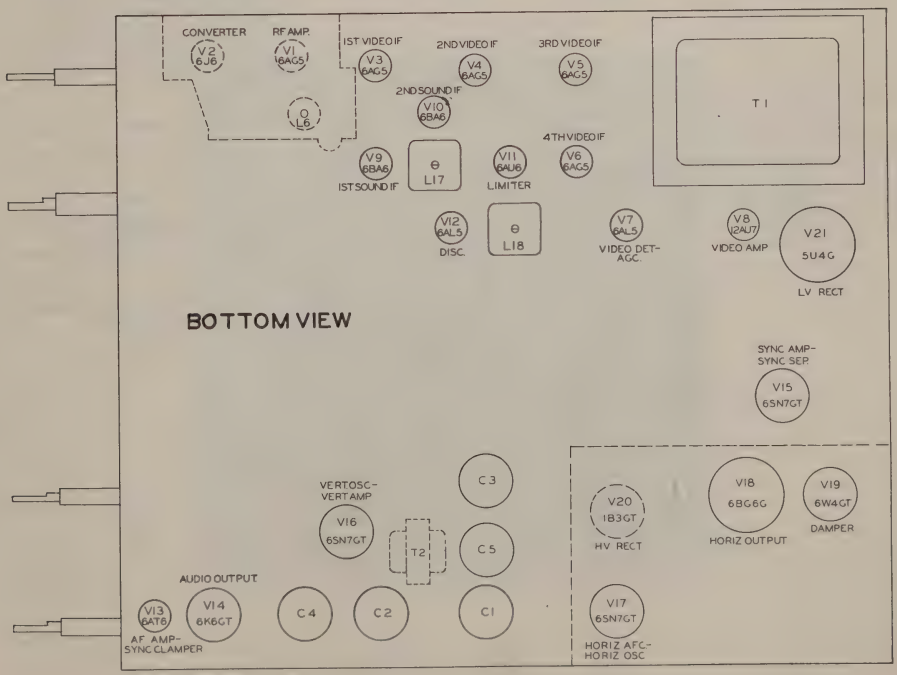


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If receiver is aligned with the picture tube removed, remove the horizontal oscillator tube V17 (6SN7GT) to eliminate the high voltage shock hazard.

The alignment procedure which follows is given in order which should be followed when complete alignment is performed.

VIDEO IF TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.		High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	21.25MC (Very accurately)	9 (If unused locally)	DC Probe to Point (A). Common to chassis.	A1, A2,	Adjust for minimum deflection.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
2.		High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	21.25MC (Very accurately)	9 (If unused locally)	DC Probe to Point (B). Common to chassis.	A3, A4, A5, A6	Adjust for maximum deflection. Attenuate signal generator to maintain a 2 volt VTVM reading.
3.		"	"	"	DC Probe to Point (C). Common to chassis.	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Repeat the adjustments of A6 and A7.

VIDEO IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.		High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	21.8MC	9 (If unused locally)	DC Probe to Point (A). Common to chassis.	A8	Adjust for maximum deflection.
5.		"	25.3MC	"	"	A9	"
6.		"	22.3MC	"	"	A10	"
7.		"	25.2MC	"	"	A11	"
8.		"	23.4MC	"	"	A12	"

VIDEO IF RESPONSE CHECK

Connect a 1 1/2 volt bias battery-negative to pin 2 of V7, positive to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.		High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	25MC (10MC SWP)	21.25MC 22.25MC 25.75MC	9	Vert. Amp. to Point (A). Low side to chassis.		Check response curve to see that it is similar to Fig 1. If slight retouching is necessary to reposition markers, adjust A1 and A2 until 21.25MC marker disappears. Adjust A9 and A11 to position the 25.75MC marker. Adjust A8 and A10 to position the 22.25MC marker. A12 will give the curve a flat top. Recheck the position of the 25.75 MC marker. Remove bias battery.

RF. AMP. ALIGNMENT (TUNER CL-1677)

Connect 1 1/2 volt bias battery as used in video IF alignment. Negative to pin 2 of V7, positive to chassis.
Set the fine tuning control to its midposition. This particular tuner incorporates one of two types of fine tuning control.
Those tuners having the fine tuning bakelite disc located in back of the oscillator slug and adjustment hole, the midpoint of its range is when the fine tuning shaft is turned completely counter-clockwise.
Those models having the fine tuning bakelite disc located in front of the oscillator slug adjustment hole, the midpoint of the fine tuning range is attained when the bakelite disc faces directly downward.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 125Ω carbon res.	Across antenna terminals with 125Ω resistor in each generator lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to Point (D). Low side to chassis.	A13, A14, A15	Adjust for flat topped response curve as per Fig 2 with markers appearing not less than 70% of maximum amplitude of the curve.
11.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check response on all channels. A13 and A14 and A15 may be adjusted slightly to obtain optimum response on all channels.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Complete alignment of the oscillator circuit may not be necessary. This is determined by checking to see that a zero reading is obtained for each channel when the fine tuning control is tuned through the midpoint of its range. (Connect signal generator and VTVM as in steps 12 and 13. Sound carrier frequencies are listed in step 13.) If the majority of the channels seem to need oscillator alignment, this sometimes may be done in one operation step 12 by adjusting A16. If should be noted that this is an all-channel adjustment and should not be adjusted for individual channels. If step 12 fails to align the oscillator circuits sufficiently, it will be necessary to adjust the oscillator coil slugs. These are accessible one channel at a time. Set the fine tuning control to the midposition of its range. (See RF Amp. Alignment for this setting.)

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	Direct	High side to one antenna terminal. Low side to chassis.	209.75MC	12	DC Prbbe to Point ◇. Common to chassis.	A16	Adjust for zero reading between positive and negative peaks with fine tuning control at its midpoint. Rotate channel selector switch and adjust individual channels outlined in step 13. Then repeat step 12.
13.	Direct	"	215.75MC	13	"	A17	
			209.75MC	12		A18	
			203.75MC	11		A19	
			197.75MC	10		A20	
			191.75MC	9		A21	
			185.75MC	8		A22	
			179.75MC	7		A23	
			87.75MC	6		A24	
			81.75MC	5		A25	
			71.75MC	4		A26	
			65.75MC	3		A27	
			59.75MC	2		A28	

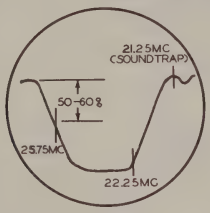


FIG.1

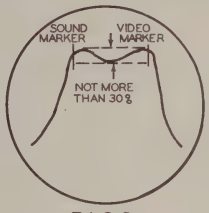
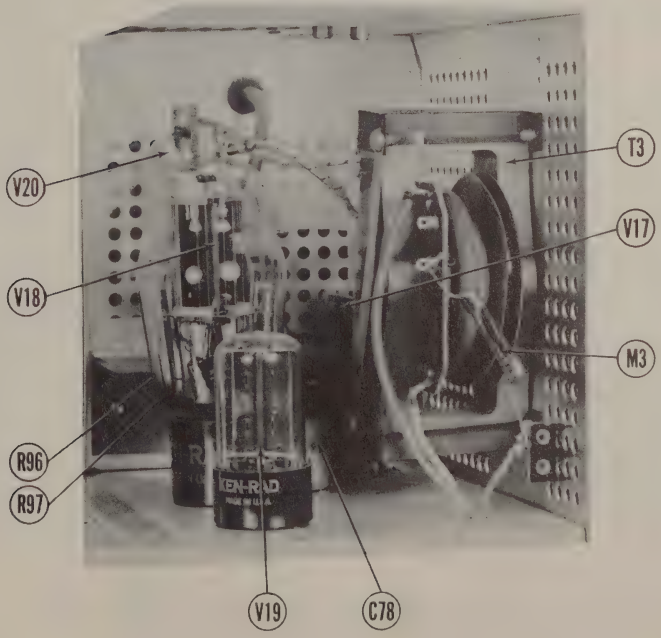


FIG.2



HIGH VOLTAGE COMPARTMENT

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.4VDC	0V.	6.3VAC	0V.	100VDC	100VDC	0V.		
V 2	6J6	75VDC	135VDC	6.3VAC	0V.	§-1.5VDC	-2VDC	0V.		
V 3	6AG5	-2.6VDC	.3VDC	6.3VAC	0V.	115VDC	115VDC	.3VDC		
V 4	6AG5	-.4VDC	.3VDC	6.3VAC	0V.	115VDC	115VDC	.3VDC		
V 5	6AG5	-.5VDC	.3VDC	6.3VAC	0V.	165VDC	115VDC	.3VDC		
V 6	6AG5	0V.	1VDC	6.3VAC	0V.	165VDC	115VDC	1VDC		
V 7	6AL5	0V.	-.1VDC	6.3VAC	0V.	3.3VDC	0V.	-1VDC		
V 8	12AU7	165VDC	-.9VDC	.1VDC	6.3VAC	6.3VAC	¶175VDC	¶-.6VDC	¶1.4VDC	0V.
V 9	6BA6	0V.	0V.	0V.	6.3VAC	200VDC	120VDC	2VDC		
V 10	6BA6	0V.	0V.	0V.	6.3VAC	200VDC	120VDC	2VDC		
V 11	6AU6	-.3VDC	0V.	0V.	6.3VAC	65VDC	65VDC	0V.		
V 12	6AL5	.1VDC	-.4VDC	6.3VAC	0V.	0V.	0V.	-.4VDC		
V 13	6AT6	-.4VDC	0V.	0V.	6.3VAC	-6.2VDC	0V.	65VDC		
V 14	6K6GT	0V.	6.3VAC	185VDC	190VDC	-5.1VDC	-18VDC	0V.	0V.	
V 15	6SN7GT	0V.	140VDC	3.7VDC	-6VDC	210VDC	2.2VDC	6.3VAC	0V.	
V 16	6SN7GT	¶-3.8VDC	¶55VDC ¶150VDC	¶0V.	¶0V.	¶340VDC	¶10VDC ¶15VDC	6.3VAC	0V.	
V 17	6SN7GT	¶-.6VDC	¶130VDC	¶12VDC	¶-45VDC	¶145VDC	¶0V.	6.3VAC	0V.	
V 18	6BG6G	0V.	6.3VAC	¶10VDC	0V.	¶0V.	¶0V.	0V.	¶250VDC	TOP CAP *
V 19	6W4GT	-95VDC	310VDC	350VDC	0V.	260VDC	0V.	6.3VAC	0V.	
V 20	1B3GT	* DO NOT MEASURE.								
V 21	5U4G	0V.	280VDC	0V.	370VAC	200VDC	370VAC	Inf.	280VDC	
V 22	16DP4	♦125VDC	¶175VDC	PIN 10 340VDC	PIN 11 33VDC	PIN 12 ♦125VDC				

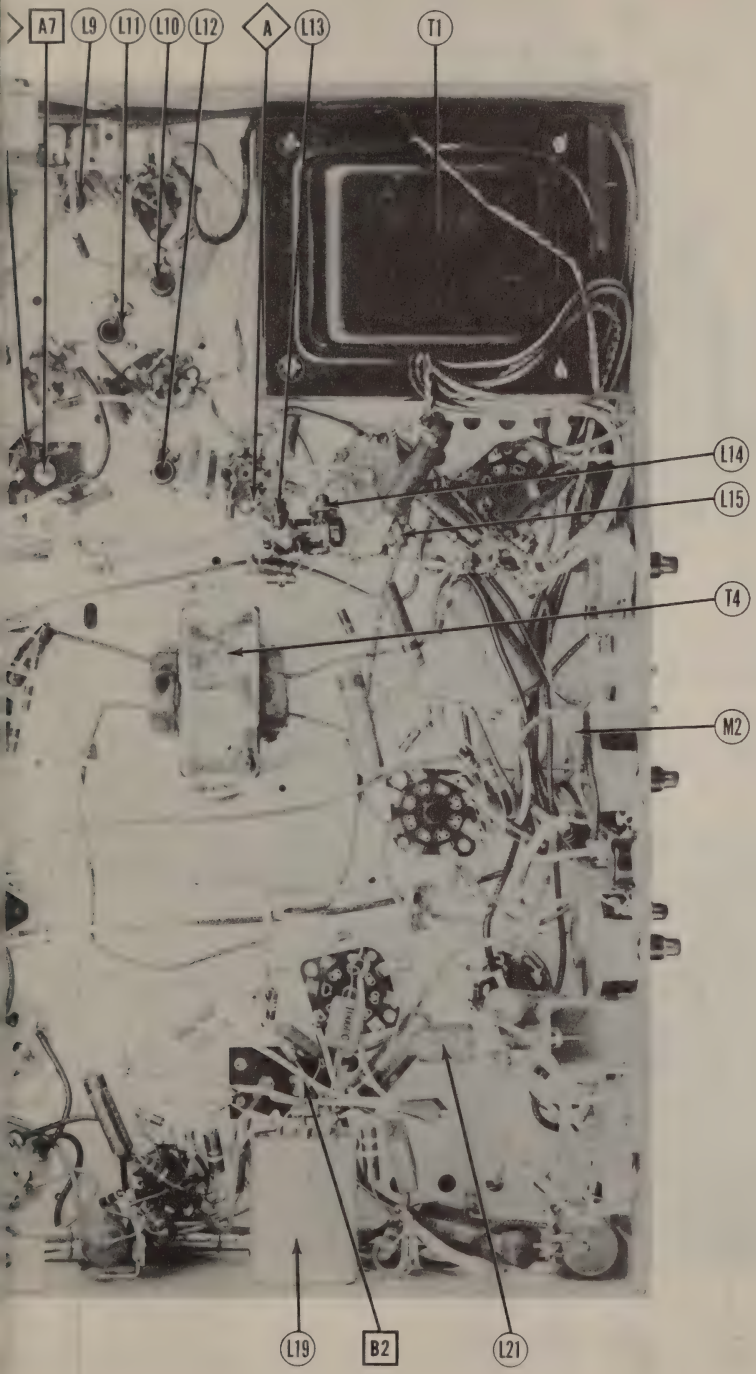
¶ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.
¶ MEASURED FROM PIN 6 OF V17.
♦ 6.3VAC MEASURED ACROSS FILAMENTS.

RESISTANCE READINGS

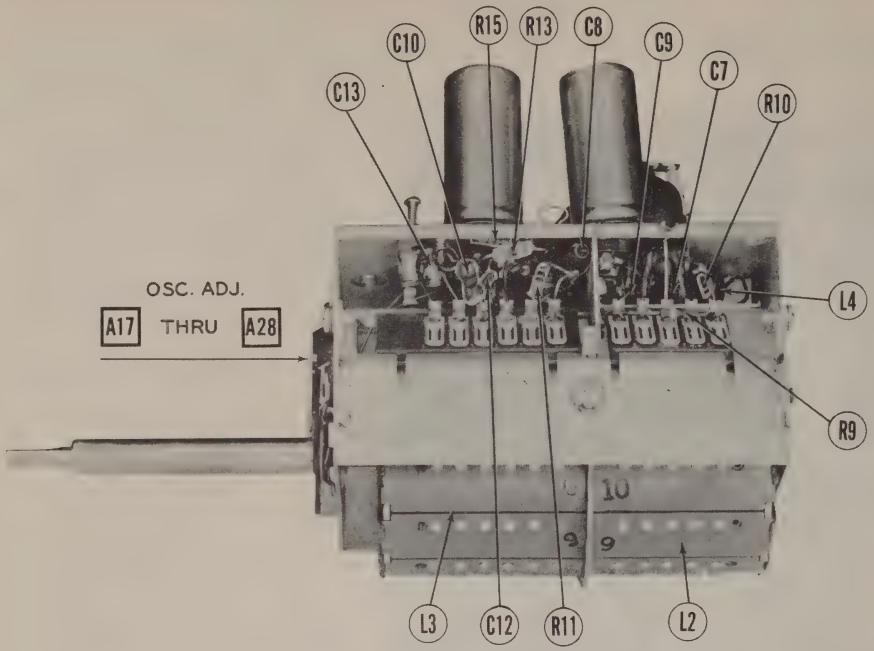
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	2 Meg.	0Ω	.1Ω	0Ω	†3.8KΩ	†3.8KΩ	0Ω		
V 2	6J6	†6KΩ	†1.5KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6AG5	2 Meg.	39Ω	.1Ω	0Ω	†2.6KΩ	†2.6KΩ	39Ω		
V 4	6AG5	2 Meg.	39Ω	.1Ω	0Ω	†2.6KΩ	†2.6KΩ	39Ω		
V 5	6AG5	2 Meg.	39Ω	.1Ω	0Ω	†8KΩ	†2.6KΩ	39Ω		
V 6	6AG5	.2Ω	150Ω	.1Ω	0Ω	†8KΩ	†2.6KΩ	150Ω		
V 7	6AL5	.2Ω	1 Meg.	.1Ω	0Ω	120Ω	0Ω	5.6KΩ		
V 8	12AU7	†4.5KΩ	1 Meg.	3.3KΩ	.1Ω	.1Ω	†5.5KΩ	1 Meg.	¶150Ω	0Ω
V 9	6BA6	0Ω	0Ω	0Ω	.1Ω	†1.5KΩ	†2.5KΩ	150Ω		
V 10	6BA6	22KΩ	0Ω	0Ω	.1Ω	†1.5KΩ	†2.5KΩ	150Ω		
V 11	6AU6	22KΩ	0Ω	0Ω	.1Ω	†12KΩ	†12KΩ	0Ω		
V 12	6AL5	200KΩ	100KΩ	.1Ω	0Ω	0Ω	0Ω	100KΩ		
V 13	6AT6	10 Meg.	0Ω	0Ω	.1Ω	3.9 Meg.	0Ω	†330KΩ		
V 14	6K6GT	Inf.	.1Ω	†2KΩ	†1.8KΩ	470KΩ	140Ω	0Ω	0Ω	
V 15	6SN7GT	1 Meg.	†22KΩ	560Ω	3.9 Meg.	†500Ω	6.8KΩ	.1Ω	0Ω	
V 16	6SN7GT	1 Meg.	#2.5 Meg. #900KΩ	¶0Ω	2.2 Meg.	†800Ω	¶5.5KΩ ¶560Ω	.1Ω	0Ω	
V 17	6SN7GT	840KΩ	#280KΩ	280KΩ	200KΩ	#140KΩ	¶0Ω	.1Ω	0Ω	
V 18	6BG6G	Inf.	.1Ω	¶82Ω	Inf.	1 Meg.	1 Meg.	0Ω	†4.7KΩ	TOP CAP #120Ω
V 19	6W4GT	700Ω	160KΩ	160KΩ	Inf.	†65Ω	Inf.	.1Ω	0Ω	
V 20	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #300Ω
V 21	5U4G	Inf.	13KΩ	InfΩ	¶24Ω	13KΩ	¶22Ω	Inf.	13KΩ	
V 22	16DP4	†1.4KΩ	†5.5KΩ	PIN 10 #56KΩ	PIN 11 80KΩ	PIN 12 †1.4KΩ				

† MEASURED FROM PIN 8 OF V21.
# MEASURED FROM PIN 3 OF V19.
¶ MEASURED FROM PIN 6 OF V17.

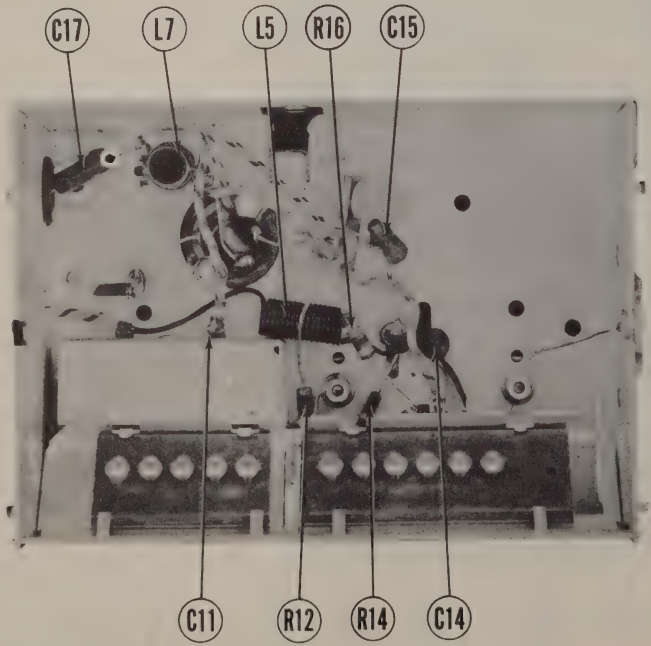
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



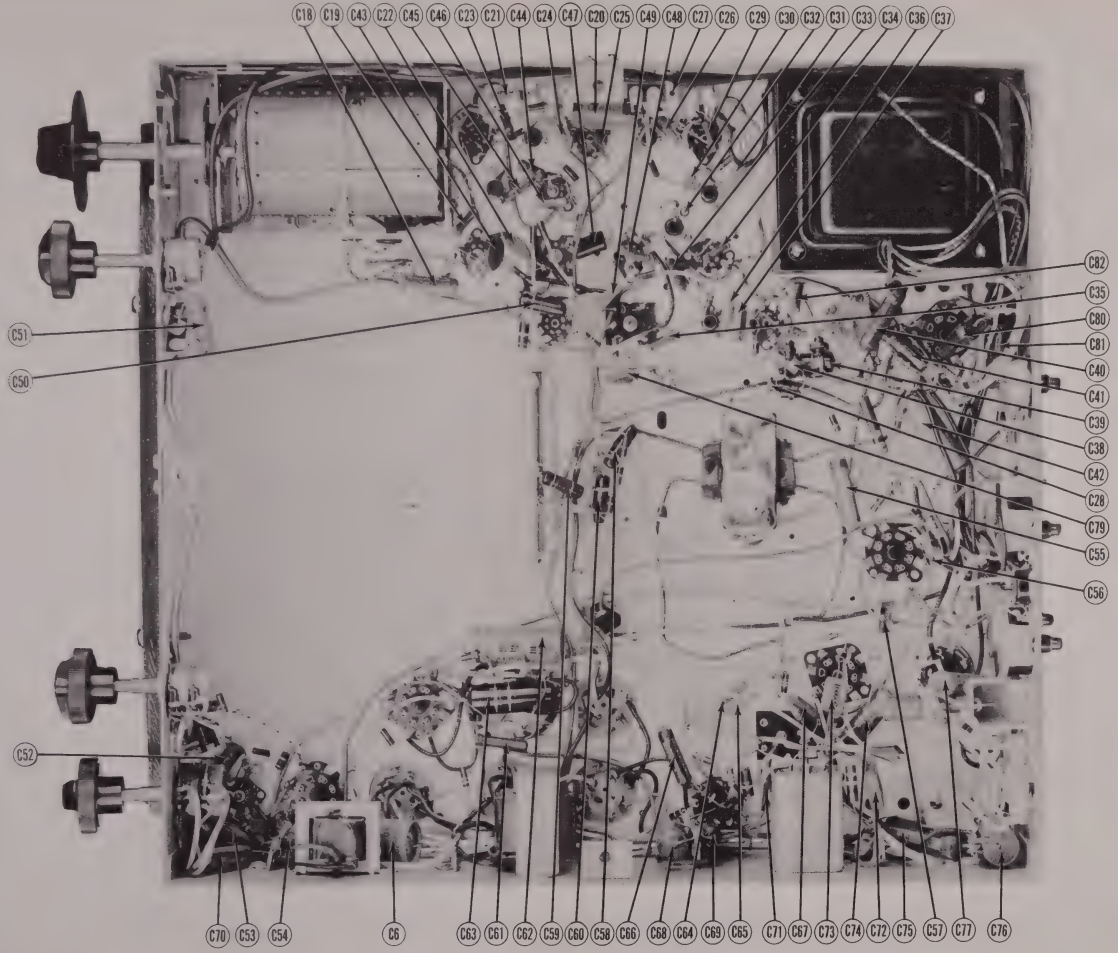
:TOR AND ALIGNMENT IDENTIFICATION



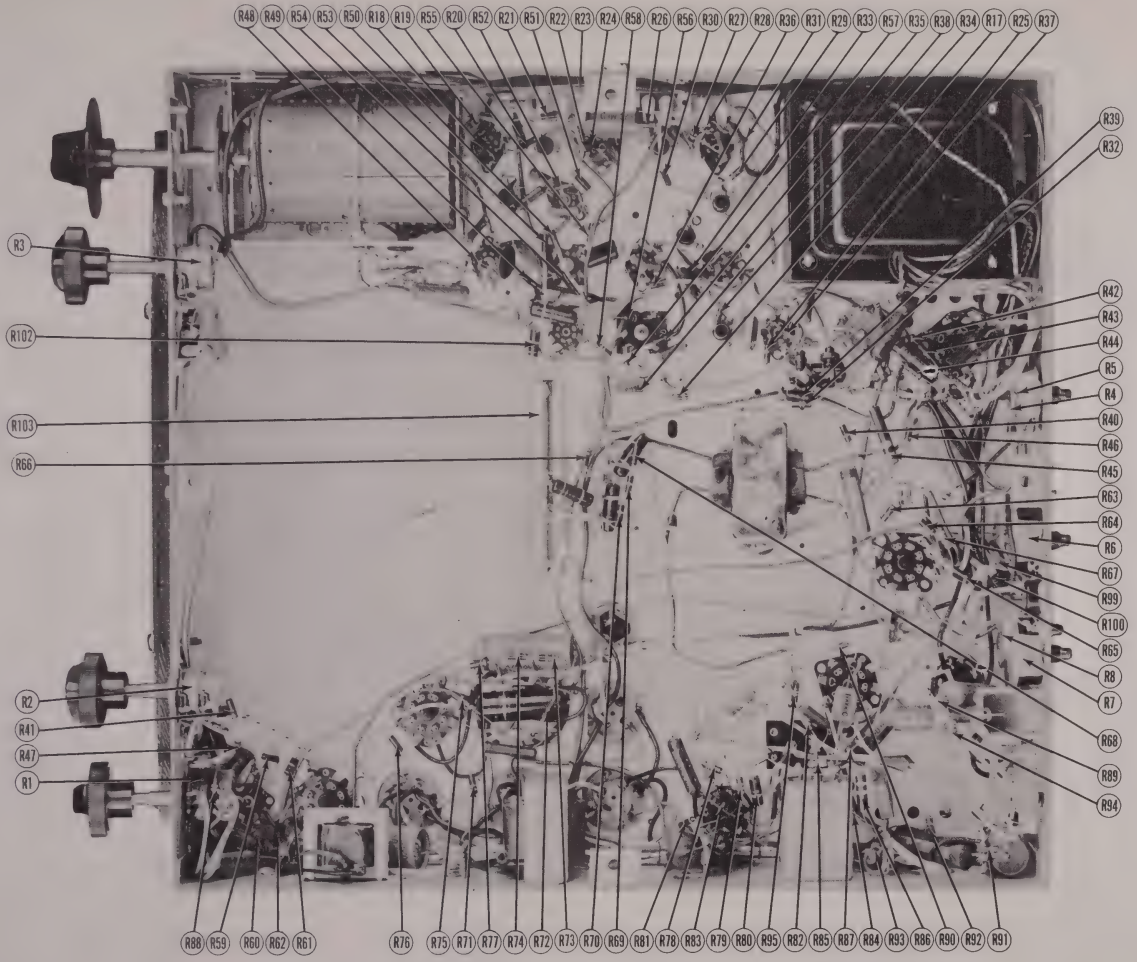
RF TUNER-RIGHT SIDE



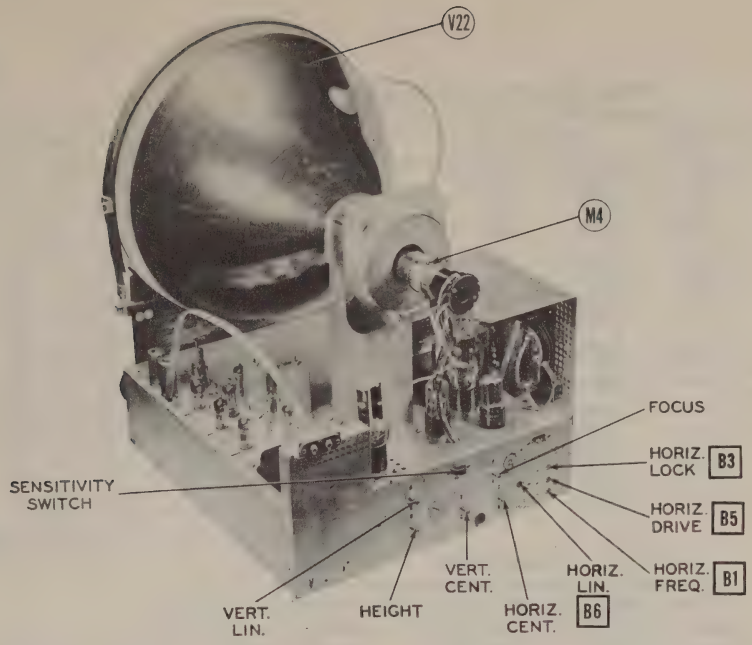
RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS-TOP VIEW

HORIZONTAL OSCILLATOR AND LINEARITY ADJUSTMENTS

HORIZONTAL OSCILLATOR ALIGNMENT CHECK:

Tune in test pattern and turn horizontal hold control to extreme counter-clockwise position. Picture should remain in synchronization. Turn channel switch to another channel and then back to the original channel. Normally, the picture should be out of synchronization. Turn the control clockwise and the picture should slowly begin to synchronize and finally lock-in. This should occur when the control is approximately 90° from the extreme counter-clockwise position. The picture should remain in synchronization for another 90° in the clockwise direction of the control. At the extreme clockwise position the picture should again drop out of synchronization and 3½ to 4½ bars should be seen sloping downward to the right. If the receiver fails to hold synchronization during this check with the hold control at the extreme counter-clockwise position or fails to hold synchronization for at least 60° in the clockwise direction from the point when it drops into sync it will be necessary to align the horizontal oscillator circuit as follows:

(A) HORIZONTAL OSCILLATOR ALIGNMENT:

Turn horizontal hold control to extreme clockwise position. Tune in test pattern and adjust trimmer B1 until picture is out of sync and shows 3½ to 4½ bars sloping downward to the right. If the trimmer has insufficient range, set it to its mid-position (one turn from tight) and adjust slug B2 until bars appear.

(B) HORIZONTAL LOCKING ALIGNMENT:

Turn the horizontal hold control to full counter-clockwise position. Switch to another channel and back to the original again.

Slowly turn horizontal hold control clockwise and note the least number of diagonal bars present just before picture syncs. If more than 4½ bars are present just before picture syncs. adjust "horizontal lock" trimmer B3 slightly clockwise. If less than 3½ bars are present adjust B3 slightly counter-clockwise and switch channel selector to another channel and back again. Recount bars present at the "lock-in" point. Repeat this procedure until 3½ to 4½ bars are present.

Repeat steps (A) and (B) until conditions exist as outlined under "Horizontal Oscillator Alignment Check".

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS:

Turn width control B4 to maximum clockwise position. Adjust "horizontal drive" trimmer B5 for maximum brightness and linearity. Adjust horizontal linearity B6 for best linearity in the right half of the picture. Readjust width control until picture fills the mask.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS:

Adjust the height control until picture fills mask vertically. Adjust the vertical linearity control until the test pattern ins symmetrical from top to bottom.

Due to intraction between these two controls it is necessary to repeat the adjustments. Adjust the vertical centering control to align the picture with the mask.

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA STARRETT PART No.	REPLACEMENT DATA STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.		6AG5	7BD	
V2	Converter		6J6	7BF	
V3	1st Video IF		6AG5	7BD	
V4	2nd Video IF		6AG5	7BD	
V5	3rd Video IF		6AG5	7BD	
V6	4th Video IF		6AG5	7BD	
V7	Video Det. -AGC Rectifier		6AL5	6BT	
V8	Video Amp.		12AU7	9A	
V9	1st Sound IF		6BA6	7BK	
V10	2nd Sound IF		6BA6	7BK	
V11	Limiter		6AU6	7BK	
V12	Disc.		6AL5	6BT	
V13	AF Amp. -Sync. Clamper		6AT6	7BT	
V14	Audio Output		6K6GT	7S	
V15	Sync. Amp. -Sync. Sep.		6SN7GT	8BD	
V16	Vert. Osc. -Vert. Amp.		6SN7GT	8BD	
V17	Hor. AFC-Hor. Osc.		6SN7GT	8BD	
V18	Hor. Output		6BG6G	5BT	
V19	Damper		6W4GT	4CG	
V20	HV Rectifier		1B3GT	3C	
V21	LV Rectifier		5U4G	5T	
V22	Picture Tube		16DP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA STARRETT PART No.	REPLACEMENT DATA AEROVOX PART No.	REPLACEMENT DATA ERIE PART No.	REPLACEMENT DATA SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450		AFH8J8D26B		TVL-57	▫ Filter
B	40	150					■ Filter
C	130	50					▲ Vert. Output Cath. Bypass
C2A	40	450		AFH8J2H		TVL-69	▫ Filter
B	10	350					▲ Filter
C3A	80	450		AFH162J		TVL-47	▫ Filter
B	10	450					▲ Decoupling
C4A	10	450		AFH2J6I6G		TVL-56	▫ Decoupling
B	30	400					■ Filter
C	30	300					▲ Filter
C5A	250	10		PRS12/250		TVL-66†	■ Hor. Cent. Cont. Bypass
B	1000	6		PRS6/1000			▲ Vert. Cent. Cont. Bypass
C6	24	300		PRS350/24		TVA-23	Output Decoupling
C7	5			CN5DNPO	NPOK-5		Fixed Trimmer
C8	120			GP120M	GP2K-120		RF Decoupling
C9	1000			GP1000M	GP2L-001		RF Filament Bypass
C10	100			GP100K	GPIK-100		RF Coupling
C11	10			CN10DNPO	NPOK-10		Fixed Trimmer
C12	20			CN20JNPO	NPOK-20		Osc. Grid Cap.
C13	10			CN10DNPO	NPOK-10		Fixed Trimmer
C14	1000			GP1000M	GP2L-001		Conv. FilamentBypass
C15	1000			GP1000M	GP2L-001		RF Bypass
C16	68			CN68JNPO	NPOL-68		Fixed Trimmer
C17	120	500		1468-00015	GP2K-120	1FM-315	IF Coupling
C18	.01	600		P688-01	821-01	TM-11	RF Bypass
C19	1500			GP1500M	GP2L-0015	1FM-215	Filament Bypass
C20	.25	400		P488-25		TC-2	AGC Filter
C21	1500			GP1500M	GP2L-0015	1FM-215	AGC Filter *
C22A	1500			GP1500M	GP2L-0015	29C6	RF Bypass
B	1500			GP1500M	GP2L-0015		2nd S. IF Plate Decoupling
C23	1500			GP1500M	GP2L-0015	1FM-215	1st V. IF Decoupling
C24	270	1000		1468-00025	GP2K-270	1FM-325	IF Coupling
C25A	1500			GP1500M	GP2L-0015	29C6	AGC Filter
B	1500			GP1500M	GP2L-0015		2nd V. IF Decoupling
C26	270	1000		1468-00025	GP2K-270	1FM-325	IF Coupling
C27	1500			GP1500M	GP2L-0015	1FM-215	AGC Filter
C28	1500			GP1500M	GP2L-0015	1FM-215	AGC Filter
C29	1500			GP1500M	GP2L-0015	1FM-215	3rd V. IF Screen Bypass
C30	1500			GP1500M	GP2L-0015	1FM-215	3rd V. IF Plate Decoupling
C31	270	1000		1468-00025	GP2K-270	1FM-325	IF Coupling
C32	75				NPOM-75		Fixed Trimmer
C33	100	500		1468-0001	GPIK-100	1FM-31	4th V. IF Cathode Bypass
C34	1500			GP1500M	GP2L-0015	1FM-215	4th V. IF Screen Bypass
C35	1500			GP1500M	GP2L-0015	1FM-215	4th V. IF Plate Decoupling
C36	270	1000		1468-00025	GP2K-270	1FM-325	IF Coupling
C37	220	500		1468-00025	GP2K-220	1FM-325	IF Coupling
C38	10	500		1468-00001	GPIK-10	MS-41	V. Diode Filter
C39	.047	400		P488-047		TM-15	Video Coupling
C40	.05	400		P488-05		TM-15	Video Coupling
C41	.005	600		P688-005	811-005	TM-25	2nd V. Amp. Cath. Bypass
C42	.25	400		P488-25		TC-2	Pic. Tube Cath. Dec.
C43A	1500			GP1500M	GP2L-0015	29C6	1st S. IF Cathode Bypass
B	1500			GP1500M	GP2L-0015		1st S. IF Screen Bypass
C44	1500			GP1500M	GP2L-0015	1FM-215	1st S. IF Plate Decoupling
C45	330	500		1468-00035	GP2K-330	1FM-335	IF Coupling
C46	1500			GP1500M	GP2L-0015	1FM-215	2nd S. IF Screen Bypass
C47	330	500		1468-00035	GP2K-330	1FM-335	Limiter Grid Filter
C48	1500			GP1500M	GP2L-0015	1FM-215	Limiter Decoupling
C49	270	1000		1468-00025	GP2K-270	1FM-325	RF Bypass
C50	.0022	600		P688-0022	GP2M-0022	TM-22	Audio Coupling
C51	.01	600		P688-01	821-01	TM-11	Audio Coupling
C52	.002	600		P688-002	GP2M-002	TM-22	De-emphasis
C53	.01	600		P688-01	821-01	TM-11	Audio Coupling

CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT	STARRETT PART No.	REPLACEMENT DATA AEROVOX PART No.	REPLACEMENT DATA
C54	.005	600		P688-005	81
C55	.05	400		P488-05	
C56	220	500		1468-00025	GP
C57	390	1000		1468-0004	GP
C58	.0022	600		P688-0022	GP
C59	.0047	600		P688-0047	GP
C60	.0047	600		P688-0047	GP
C61	4700			GP4700M	GP
C62	.1	1000		1084-1	
C63	.22	400		P488-22	
C64	120	1000		1468-00015	GP
C65	120	1000		1468-00015	GP
C66	.002	600		P688-002	GP
C67	4	1500			
C68	.25	400		P488-25	
C69	.022	400		P488-022	
C70	.05	400		P488-05	
C71	180	1000		1468-0002	GP
C72	2200	1000			GP
C73	390	1000		1468-0004	GP
C74	.05	600		P688-05	
C75	.25	400		P488-25	
C76	.1	1000		1084-1	
C77	.035	1000		P1088-033	
C78	500	15000			41
C79	1500			GP1500M	GP
C80	.01	600		P688-01	82
C81	.01	600		P688-01	82
C82	1500			GP1500M	GP

* Not used in all models.
† Enlarge hole and install new mounting hplate.

C

ITEM No.	RATING RESIST-ANCE	RATING WATTS	REPLACEMENT DATA STARRETT PART No.	REPLACEMENT DATA IRC PART No.	C P
R1A	1 Meg.			B11-137 *	PT
B	50KΩ			B11-123 *	
C	Shaft End			E187 *	
R2A	500KΩ			B11-133 *	PT
B	10KΩ			B11-116 *	
C	Shaft End			E187 *	
R3A	1 Meg.			Q13-137	M
B	Switch			76-1	SW
R4	5000Ω			Q11-114	M
R5	2.5 Meg.			Q11-239	M
R6	20Ω	2		W-20x10	43
R7	30Ω	2		W-30	43
R8	2250Ω	4			10

* Additional parts to be used with "Concentrikit".

R

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA STARRETT PART No.	REPLACEMENT DATA IRC PART No.
R9	3900Ω			BTS-3900
R10	47KΩ			BTS-47K
R11	10KΩ			BTS-10K
R12	2200Ω 20%			BTS-2200
R13	4700Ω			BTS-4700
R14	220KΩ 20%			
R15	10KΩ			BTS-10K
R16	4700Ω			BTS-4700
R17	4700Ω			BTS-4700
R18	10KΩ			
R19	39Ω			
R20	1000Ω 20%			BTS-1000
R21	1000Ω 20%			BTS-1000
R22	10KΩ			
R23	39Ω			
R24	1000Ω 20%			BTS-1000
R25	1 Meg. 20%			BTS-1 Meg
R26	1000Ω 20%			BTS-1000
R27	4700Ω			
R28	39Ω			
R29	5600Ω 5%			
R30	1000Ω 20%			BTS-1000
R31	1000Ω 20%			BTS-1000
R32	100KΩ			BTS-100K
R33	150Ω			
R34	5600Ω 5%			
R35	1000Ω 20%			BTS-1000
R36	1000Ω 20%			BTS-1000
R37	1 Meg. 20%			BTS-1 Meg
R38	560KΩ 5%			BTS-560K
R39	5600Ω 5%			BTS-5600
R40	1 Meg. 20%			BTS-1 Meg
R41	3300Ω 20%			BTS-3300
R42	3900Ω			BTS-3900
R43	1 Meg. 20%			BTS-1 Meg
R44	150Ω			
R45	3300Ω			BTA-3300
R46	820Ω			BTS-820
R47	100KΩ			BTS-100K
R48	150Ω			

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: STARRETT PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6AG5	6AG5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF	6AG5	6AG5	7BD	
V4	2nd Video IF	6AG5	6AG5	7BD	
V5	3rd Video IF	6AG5	6AG5	7BD	
V6	4th Video IF	6AG5	6AG5	7BD	
V7	Video Det.-AGC Rectifier	6AL5	6AL5	6BT	
V8	Video Amp.	12AU7	12AU7	9A	
V9	1st Sound IF	6BA6	6BA6	7BK	
V10	2nd Sound IF	6BA6	6BA6	7BK	
V11	Limiter	6AU6	6AU6	7BK	
V12	Discr.	6AL5	6AL5	6BT	
V13	A.F Amp. -Sync. Clamper	6AT6	6AT6	7BT	
V14	Audio Output	6K6GT	6K6GT	7S	
V15	Sync. Amp.-Sync. Sep.	6SN7GT	6SN7GT	8BD	
V16	Vert. Osc.-Vert. Amp.	6SN7GT	6SN7GT	8BD	
V17	Hor. AFC-Hor. Osc.	6SN7GT	6SN7GT	8BD	
V18	Hor. Output	6BG6G	6BG6G	5BT	
V19	Damper	6W4GT	6W4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	
V21	LV Rectifier	5U4G	5U4G	5T	
V22	Picture Tube	16DP4	16DP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: STARRETT PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450		AFH8J8D26B		TVL-57	▲ Filter
B	40	150					▲ Filter
C	180	50					■ Vert. Output Cath. Bypass
C2A	40	450		AFH8J2H		TVL-69	▲ Filter
B	10	350					▲ Filter
C3A	80	450		AFH16J		TVL-47	▲ Filter
B	10	450					▲ Decoupling
C4A	10	450		AFH2J616G		TVL-56	▲ Decoupling
B	30	400					■ Filter
C	30	300					▲ Filter
C5A	350	10		PRS13/350		TVL-661	■ Hor. Cent. Cont. Bypass
B	1000	6		PRS6/1000			▲ Vert. Cent. Cont. Bypass
C6	34	300		PRS350/34		TVA-23	Output Decoupling
C7	5			CN5DNPO			Fixed Trimmer
C8	120			GP120M	GP2K-120		RF Decoupling
C9	1000			GP1000M	GP2L-001		RF Filament Bypass
C10	100			GP100E	GP1K-100		RF Coupling
C11	10			CN10DNPO	NPOK-10		Fixed Trimmer
C12	30			CN30FNPO	NPOK-30		Osc. Grid Cap.
C13	10			CN10DNPO	NPOK-10		Fixed Trimmer
C14	1000			GP1000M	GP2L-001		Conv. FilamentBypass
C15	1000			GP1000M	GP2L-001		RF Bypass
C16	68			CN68J NPO	NPOL-68		Fixed Trimmer
C17	120	500		1468-00035	GP2K-130	1FM-315	IF Coupling
C18	.01	600		P686-01	821-01	TM-11	RF Bypass
C19	1500			GP1500M	GP2L-0015	1FM-215	Filament Bypass
C20	.25	400		P488-25		TC-2	AGC Filter
C21	1500			GP1500M	GP2L-0015	1FM-215	AGC Filter *
C22A	1500			GP1500M	GP2L-0015		RF Bypass
E	[illegible]			GP1500M	GP2L-0015	29C6	2nd S. IF Plate Decoupling
C23	1500			GP1500M	GP2L-0015	1FM-215	1st V. IF Decoupling
C24	270	1000		1468-00025	GP2K-270	1FM-325	IF Coupling
C25A	1500			GP1500M	GP2L-0015	29C6	AGC Filter
E	[illegible]			GP1500M	GP2L-0015		2nd V. IF Decoupling
C26	270	1000		1468-00025	GP2K-270	1FM-325	IF Coupling
C27	1500			GP1500M	GP2L-0015	1FM-215	AGC Filter
C28	1500			GP1500M	GP2L-0015	1FM-215	AGC Filter
C29	1500			GP1500M	GP2L-0015	1FM-215	3rd V. IF Screen Bypass
C30	1500			GP1500M	GP2L-0015	1FM-215	3rd V. IF Plate Decoupling
C31	270	1000		1468-00025	GP2K-270	1FM-325	IF Coupling
C32	75				NPOM-75		Fixed Trimmer
C33	300	500		1468-0001	GP1K-100	1FM-31	4th V. IF Cathode Bypass
C34	1500			GP1500M	GP2L-0015	1FM-215	4th V. IF Screen Bypass
C35	1500			GP1500M	GP2L-0015	1FM-215	4th V. IF Plate Decoupling
C36	270	1000		1468-00025	GP2K-270	1FM-325	IF Coupling
C37	220	500		1468-00025	GP2K-220	1FM-325	IF Coupling
C38	10	500		1468-00008	GP1K-10	MS-41	V. Diode Filter
C39	.047	400		P488-047		TM-15	Video Coupling
C40	.05	400		P488-05		TM-15	Video Coupling
C41	.005	600		P686-005	81I-005	TM-25	2nd V. Amp. Cath. Bypass
C42	.25	400		P488-25		TC-2	Pic. Tube Cath. Dec.
C43A	1500			GP1500M	GP2L-0015	29C6	1st S. IF Cathode Bypass
B	1500			GP1500M	GP2L-0015		1st S. IF Screen Bypass
C44	1500			GP1500M	GP2L-0015	1FM-215	1st S. IF Plate Decoupling
C45	330	500		1468-00025	GP2K-330	1FM-325	IF Coupling
C46	1500			GP1500M	GP2L-0015	1FM-215	2nd S. IF Screen Bypass
C47	330	500		1468-00025	GP2K-330	1FM-335	Limiter Grid Filter
C48	1500			GP1500M	GP2L-0015	1FM-215	Limiter Decoupling
C49	270	1000		1468-00025	GP2K-270	1FM-325	RF Bypass
C50	.0022	600		P688-0022	GP2M-0022	TM-22	Audio Coupling
C51	.01	600		P686-01	821-01	TM-11	Audio Coupling
C52	.002	500		P688-003	GP2M-002	TM-22	De-emphasis
C53	.01	600		P686-01	821-01	TM-11	Audio Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: STARRETT PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C54	.005	600		P688-005	81I-005	TM-25	Output Plate Bypass
C55	.05	400		P488-05		TM-15	Sync. Coupling
C56	220	500		1468-00025	GP2K-220	1FM-325	Sync. Coupling
C57	390	1000		1468-0004	GP2K-390	1FM-34	Sync. Sep. Cathode Bypass
C58	.0022	600		P688-0022	GP2M-0022	TM-22	Integrator Net.
C59	.0047	600		P688-0047	GP2M-0047	TM-25	Integrator Net.
C60	.0047	600		P688-0047	GP2M-0047	TM-25	Integrator Net.
C61	4700			GP4700M	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C62	.1	1000		1084-1		PX-11	Vert. Discharge
C63	.22	400		P488-22		TC-2	Vert. Sweep Coupling
C64	120	1000		1468-00015	GP2K-120	1FM-315	Hor. Sync. Coupling
C65	120	1000		1468-00015	GP2K-120	1FM-315	Voltage Divider
C66	.002	600		P688-002	GP2M-002	TM-22	Hor. Sync. Coupling
C67	4	1500					Hor. Feedback
C68	.05	400		P488-25		TC-2	AFC Filter
C69	.022	400		P488-022		TM-12	AFC Filter
C70	.05	400		P488-05		TM-15	AFC Plate Bypass
C71	180	1000		1468-0002	GP2K-180	1FM-32	Hor. Osc. Grid Cap.
C72	2200	1000			GP2M-0022		Hor. Discharge
C73	390	1000		1468-0004	GP2K-390	1FM-34	Hor. Sweep Coupling
C74	.05	600		P688-05		TM-15	Hor. Output Screen Bypass
C75	.25	400		P488-25		TC-2	Hor. Output Cath. Bypass
C76	.1	1000		1084-1		PX-11	Damper Filter
C77	.035	1000		P1088-033			Damper Filter
C78	500	15000			410-500		HV Filter
C79	1500			GP1500M	GP2L-0015	1FM-215	RF Bypass *
C80	.01	600		P688-01	821-01	TM-11	Line Filter
C81	.01	600		P688-01	821-01	TM-11	Line Filter
C82	1500			GP1500M	GP2L-0015	1FM-215	DAGC Decoupling *

* Not used in all models.
† Enlarge hole and install new mounting hplate.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STARRETT PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.			B11-137 *		Vert. Hold Control, panel
B	50KΩ			B11-123 *	PT-1479	Horiz. Hold Control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
R2A	500KΩ			B11-133 *		Brightness control, panel
B	10KΩ			B11-116 *	PT-1478	Contrast control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
R3A	1 Meg.			Q13-137	M-63-Z	Volume control
B	Switch			76-1	SW-A	Attach to R3A per instructions
R4	500KΩ			Q11-114	M-19-S	Vert. linearity control
R5	2.5 Meg.			Q11-239	M-94-S	Height control
R6	20Ω	2		W-20x10	43-20CT	Vert. centering control-Wire Wound, tapped at 10Ω
R7	30Ω	2		W-30	43-30	Horiz. centering control, Wire Wound
R8	22500Ω	4			10-2500	Focus control-Wire Wound

* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STARRETT PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R9	3900Ω			BTS-3900	RF Grid
R10	47KΩ			BTS-47K	AGC Network
R11	10KΩ			BTS-10K	RF Plate Coil Shunt
R12	2200Ω 20%			BTS-2200	RF Decoupling
R13	470Ω			BTS-4700	Mixer Grid
R14	220KΩ 20%				Mixer Grid
R15	10KΩ			BTS-10K	Osc. Grid
R16	470Ω			BTS-4700	Osc. Plate
R17	4700Ω			BTS-4700	Voltage Divider
R18	10KΩ				1st Video IF Grid
R19	39Ω				1st Video IF Cathode
R20	1000Ω 20%			BTS-1000	1st Video IF Decoupling
R21	1000Ω 20%			BTS-1000	AGC Network
R22	10KΩ				2nd Video IF Grid
R23	39Ω				2nd Video IF Cathode
R24	1000Ω 20%			BTS-1000	2nd Video IF Decoupling
R25	1 Meg. 20%			BTS-1 Meg.	AGC Network
R26	1000Ω 20%			BTS-1000	AGC Network
R27	4700Ω				3rd Video IF Grid
R28	39Ω				3rd Video IF Cathode
R29	5600Ω 5%				3rd Video IF Plate
R30	1000Ω 20%			BTS-1000	3rd Video IF Plate Decoupling
R31	1000Ω 20%			BTS-1000	3rd Video IF Screen Decoupling
R32	100KΩ			BTS-100K	AGC Network
R33	150Ω				4th Video IF Cathode
R34	5600Ω 5%				4th Video IF Plate
R35	1000Ω 20%			BTS-1000	4th Video IF Plate Decoupling
R36	1000Ω 20%			BTS-1000	4th Video IF Screen Decoupling
R37	1 Meg. 20%			BTS-1 Meg.	AGC Rect. Diode Load
R38	560KΩ 5%			BTS-560K-5%	Voltage Divider
R39	5600Ω 5%			BTS-5600-5%	Video Det. Diode Load
R40	1 Meg. 20%			BTS-1 Meg.	Video Amp. Grid
R41	3300Ω 20%			BTS-3300	Video Amp. Cathode
R42	3900Ω			BTS-3900	Video Amp. Plate
R43	1 Meg. 20%			BTS-1 Meg.	Video Amp. Grid
R44	150Ω				Video Amp. Cathode
R45	3300Ω			BTA-3300	Video Amp. Plate
R46	820Ω			BTS-820	Video Amp. Plate
R47	100KΩ			BTS-100K	Voltage Divider
R48	150Ω				1st Sound IF Cathode

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STARRETT PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R49	1000Ω 20%			BTS-1000	1st Sound IF Screen Decoupling
R50	1000Ω 20%			BTS-1000	1st Sound IF Plate Decoupling
R51	22KΩ 20%				2nd Sound IF Grid
R52	150Ω				2nd Sound IF Cathode
R53	1000Ω 20%			BTS-1000	2nd Sound IF Screen Decoupling
R54	1000Ω 20%			BTS-1000	2nd Sound IF Plate Decoupling
R55	22KΩ 20%				Limiter Grid
R56	10KΩ				Limiter Decoupling
R57	100KΩ			BTS-100K	Disc. Diode Load
R58	100KΩ			BTS-100K	Disc. Diode Load
R59	10 Meg. 20%			BTS-10 Meg.	AF Grid
R60	330KΩ			BTS-330K	AF Plate
R61	470KΩ 20%			BTS-470K	Output Grid
R62	1000Ω 20%			BTA-1000	Filter
R63	1 Meg. 20%			BTS-1 Meg.	Sync. Amp. Grid
R64	560Ω			BTS-560	Sync. Amp. Cathode
R65	22KΩ 20%	1		BTA-22K	Sync. Amp. Plate
R66	6800Ω 20%			BTS-6800	Sync. Sep. Cathode
R67	3.9 Meg.			BTS-3.9 Meg.	Sync. Sep. Grid
R68	22KΩ 20%			BTS-22K	Integrator
R69	8200Ω			BTS-8200	Integrator
R70	8200Ω			BTS-8200	Integrator
R71	1 Meg.			BTS-1 Meg.	Vert. Osc. Grid
R72	1 Meg.			BTS-1 Meg.	Vert. Osc. Plate
R73	6.8 Meg.			BTS-6.8 Meg.	Voltage Divider
R74	100KΩ			BTS-100K	Voltage Divider
R75	560Ω			BTS-560	Vert. Amp. Cathode
R76	2.2 Meg. 20%			BTS-2.2 Meg.	Vert. Amp. Grid
R77	3300Ω 20%			BTS-3300	Vert. Peaking
R78	560KΩ			BTS-560K	Horiz. AFC Grid
R79	180KΩ			BTS-180K	Horiz. AFC Cathode
R80	100KΩ 5%	1		BTA-100K-5%	Horiz. AFC Cathode
R81	8200Ω			BTS-8200	Horiz. AFC Filter Network
R82	150KΩ			BTS-150K	Horiz. AFC Filter Network
R83	3.3 Meg.	1		BTA-3.3 Meg.	Voltage Divider
R84	100KΩ 5%	1		BTA-100K-5%	Horiz. Osc. Grid
R85	10KΩ			BTS-10K	Horiz. Osc. Transformer Shunt
R86	120KΩ	1		BTA-120K	Horiz. Osc. Plate
R87	270KΩ	1		BTA-270K	Voltage Divider
R88	120KΩ			BTS-120K	Voltage Divider
R89	10KΩ 20%			BTS-10K	Filter
R90	47Ω 20%				Parasitic Supp.
R91	1 Meg. 20%			BTS-1 Meg.	Horiz. Output Grid
R92	82Ω	1		BW-1-82	Horiz. Output Cathode
R93	4700Ω	1		BTA-4700	Horiz. Output Screen
R94	56KΩ			BTS-56K	Filter
R95	560KΩ			BTS-560K	Feedback
R96	3.3Ω	1			HV Rect. Filament-Wire Wound
R97	1 Meg. 20%	2			HV Filter
R98	680Ω	1		BTA-680	Focus Coil Shunt-See Note 1
R99	470Ω	1		BTA-470	Focus Coil Shunt-See Note 2
R100	470Ω	1		BTA-470	Focus Coil Shunt-See Note 2
R101A	610Ω	20			Bias Network-Wire Wound
B	1125Ω	20			Filter-Wire Wound
R102	3300Ω	1		BTA-3300	Bleeder
R103A	8200Ω	5			Bleeder-Wire Wound
B	35Ω	1			Bias Network-Wire Wound
C	100Ω	2			Bias Network-Wire Wound

Note 1. Not used in all models.
Note 2. Some models use 680Ω, 1 watt resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: STARRETT PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC ② 2.05A	760VCT .275ADC ①	5VAC 3A	6.3VAC ② 9.8A		P-8153 ④ and P-5014	P-3059	TP-355
				SEC. 4 6.3VAC ② 5A				

④ Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC	REPLACEMENT DATA: STARRETT PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	180Ω	100Ω		A-8111 ④	A-3000 ④	TDO-1 ④	Vert. Block Osc. Trans.
T3	290Ω	SEC. 1		A-8128	HVO-3	TFB-3	Hor. Output Trans.
	Tap. ⑤ 90Ω	70 Tap. ⑤ 50					
		SEC. 2 60					
T4	770Ω	8.2Ω		A-8112	A-3035 ④	TSO-5	Vert. Output Trans.
T5A	14Ω			DY-1			Hor. Deflection Coil
B	60Ω						Vert. Deflection Coil
T6	810Ω						Focus Coil

④ Drill one new mounting hole.
⑤ Drill new mounting holes.

STARRETT MODELS "HENRY HUDSON" "HENRY PARKS," "ROBERT E. LEE"

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		STARRETT	STANCOR	MERIT	CHICAGO	
	PRI.	SEC.	PRI.	SEC.	PART No.	PART No.	PART No.	PART No.	
T7	6.2KΩ	3.7Ω	275Ω	.4Ω		A-8114	A-2931	RO-13	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	STARRETT PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	3.4Ω		ST-119 ① MOD. P10-T	10A31	① Replace output transformer to match 6-8Ω voice coil.
	CONE DIA.	V. C. DIA.				
SP2	9 1/2"	3/4"				

FILTER CHOKE

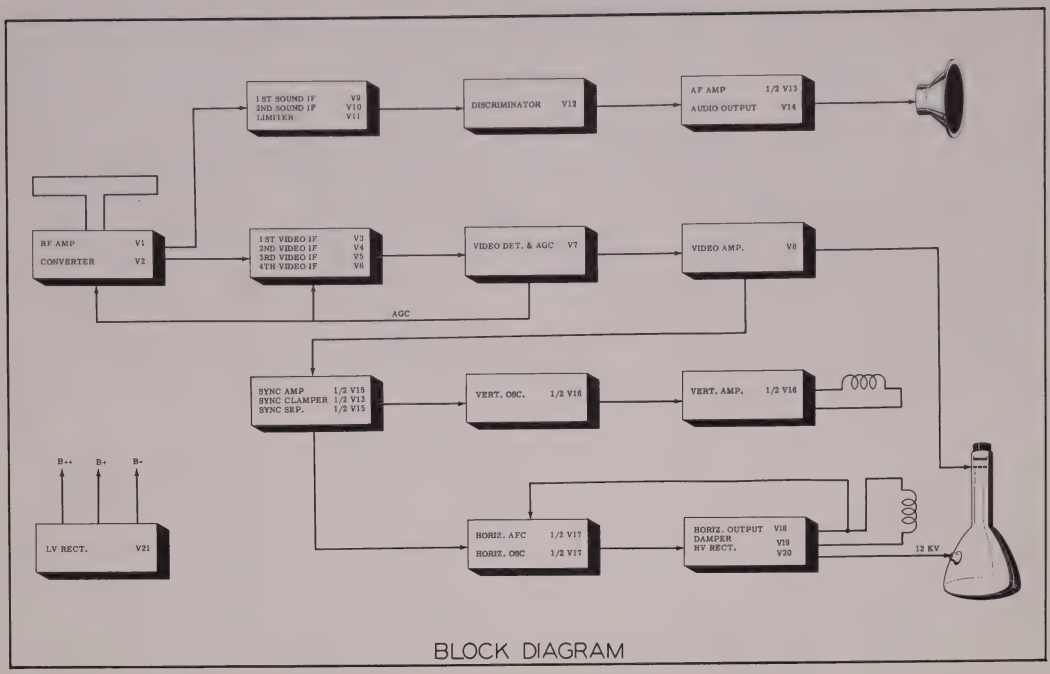
ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∼)	STARRETT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.275A	62Ω	2.6 Henries		C-2326 ②	C-2991 ②	TR-3300 ②	② Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	STARRETT PART No.	MEISSNER PART No.	
L2	Ant. Coil	0Ω				
L3	RF, Mixer & Osc. Coils	0Ω				
L4	Fil. Choke	0Ω				
L5	Fil. Choke	0Ω				
L6	1st Video IF & Sound Trap	.2Ω	0Ω			
L7	Video Coupling	1Ω				
L8	2nd Video IF	.2Ω				
L9	3rd Video IF	.2Ω				
L10	4th Video IF	.2Ω				
L11	Sound Trap	.2Ω	0Ω			
L12	5th Video IF	.2Ω				
L13	Peaking	3Ω				36 microhenries, black dot.
L14	Peaking	8Ω				180 microhenries, wound on 39KΩ resistor. white dot.
L15	Peaking	5.5Ω				122 microhenries, wound on 22KΩ resistor. blue dot.
L16	1st Sound IF	.2Ω				
L17	2nd Sound IF	.2Ω	.1Ω			
L18	Disc. Trans.	.1Ω	.1Ω			
L19	Horiz. Osc.	150Ω				
L20	Width Cont.	.2Ω				Not used in all models.
L21	Horiz. Linearity	36Ω				

MISCELLANEOUS

ITEM No.	PART NAME	STARRETT PART No.	NOTES
M1	RF Tuner		
M2	Switch		Sensitivity
M3	Fuse		.25A, 250V
M4	Ion Trap		Permanent magnet type



BLOCK DIAGRAM

PHOTOFACT* Folder

SYLVANIA MODELS

1-075, 1-113, 1-114, 1-124, 1-125, 1-177

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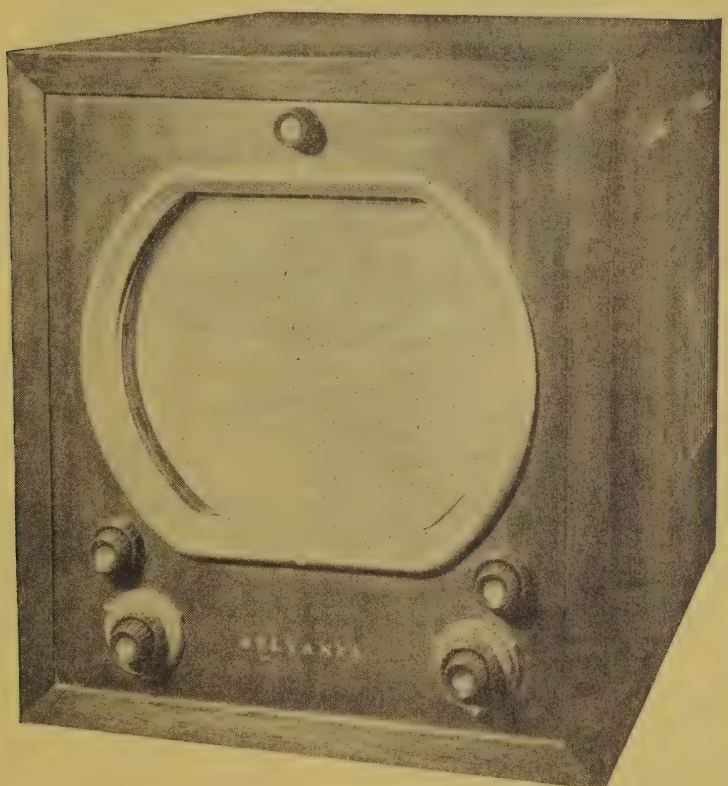

MODEL 1-075

SYLVANIA MODELS
1-075, 1-113, 1-114, 1-124, 1-125, 1-177

PD #18

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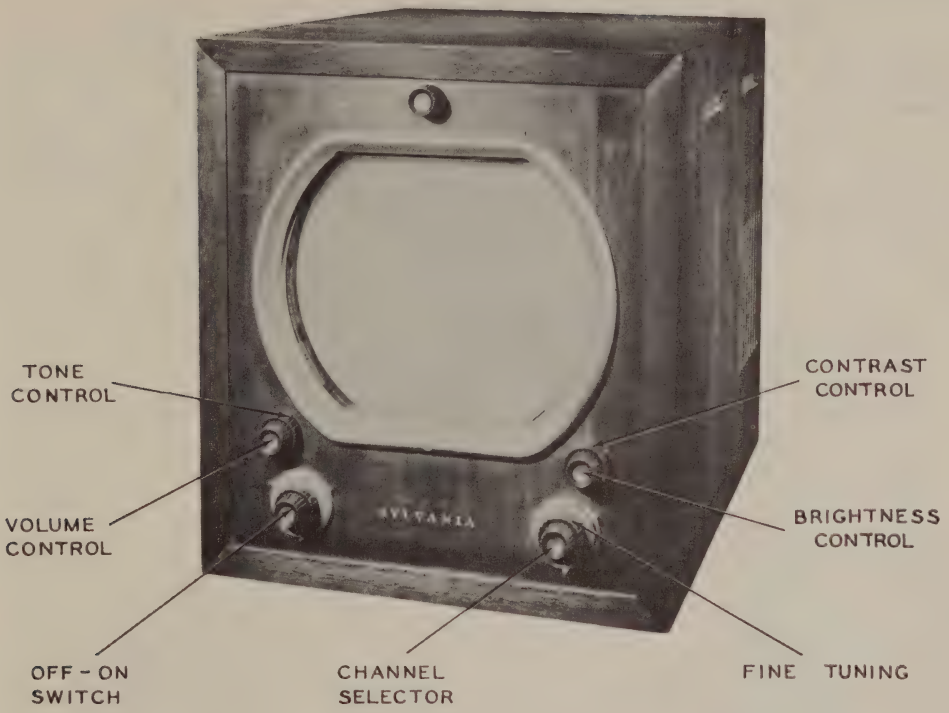

SYLVANIA MODELS 1-075, 1-113, 1-114, 1-124, 1-125, 1-177

SYLVANIA MODEL 1-075

TRADE NAME	Sylvania Models 1-075, 1-113, 1-114, 1-124, 1-125 (Ch. 1-139) 1-177 (Ch. 1-186)
MANUFACTURER	Sylvania Elect. Prod. Inc., Colonial Radio & Tel. Div. 254 Rano St., Buffalo 7, New York
TYPE SET	Television Receiver
TUBES	Twenty Eight

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 2.19 Amp. at 117 Volts AC
TUNING RANGE—Channels 2 thru 13

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Voltage & Resistance Measurements 8

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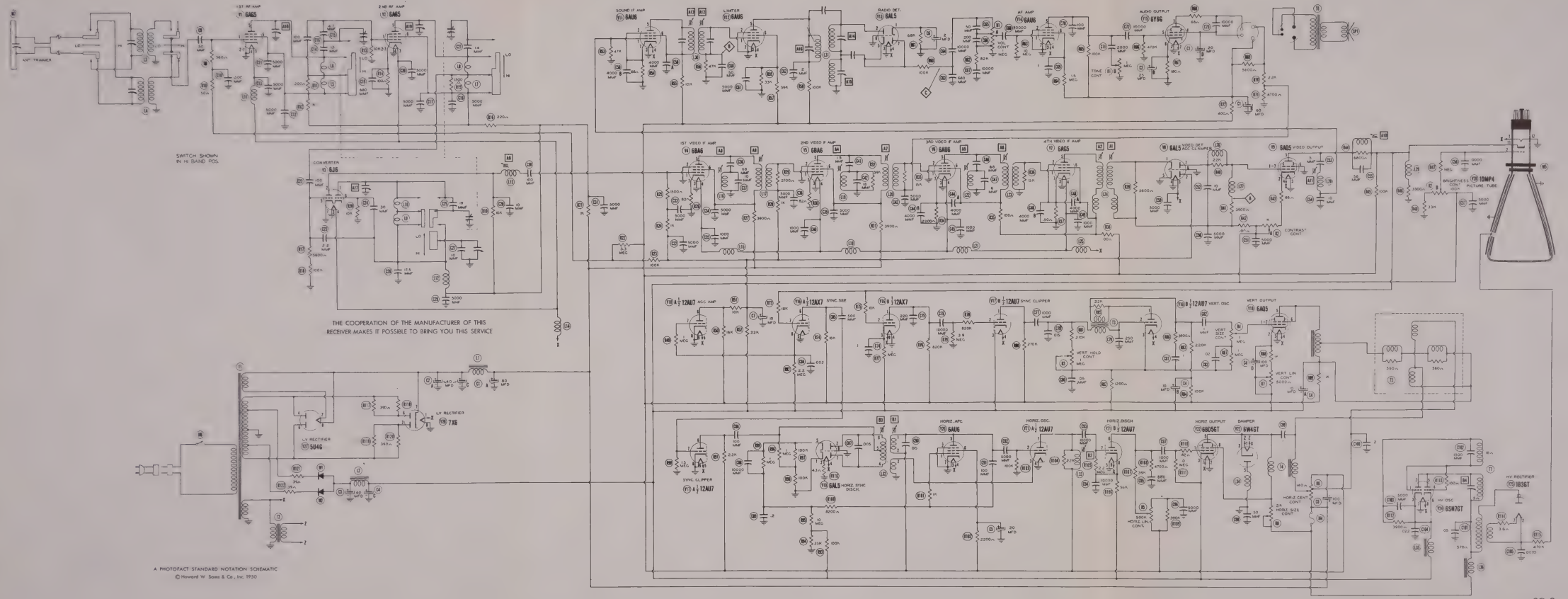
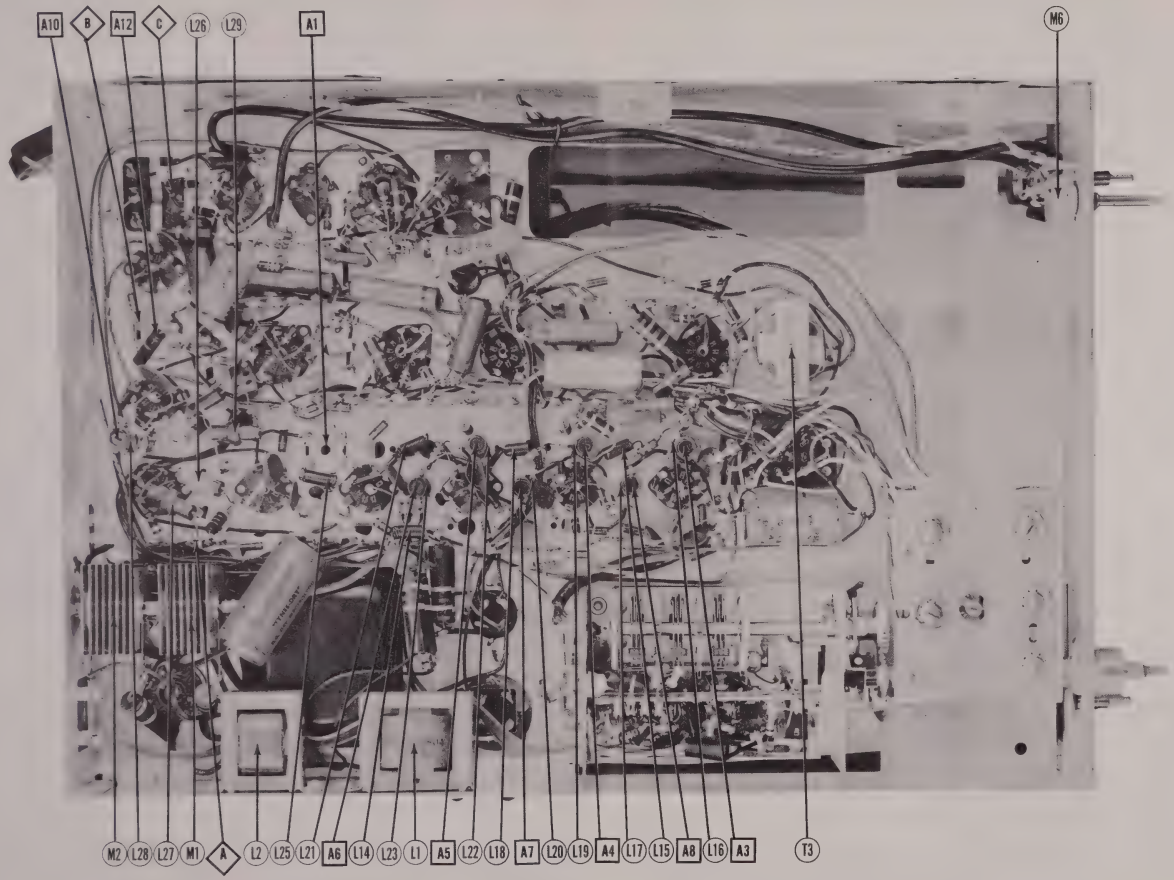
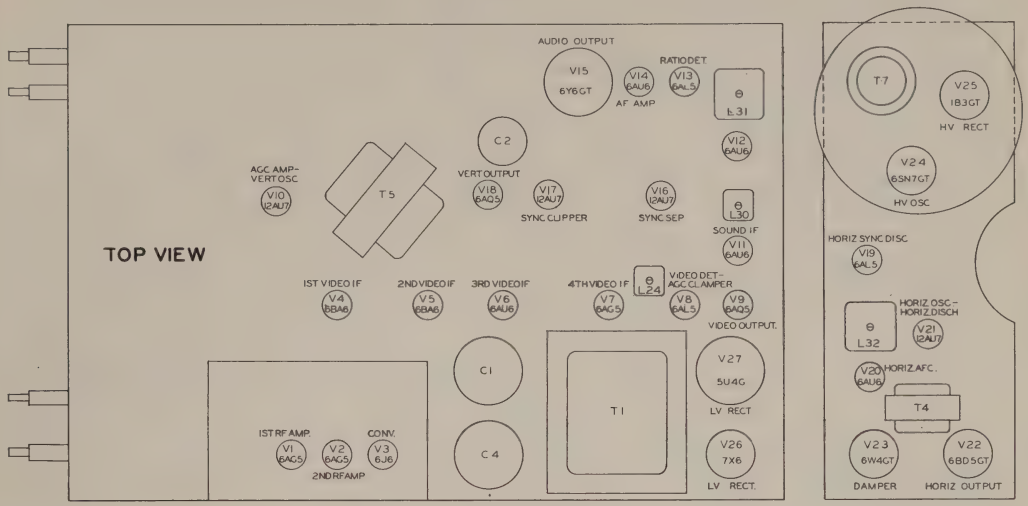
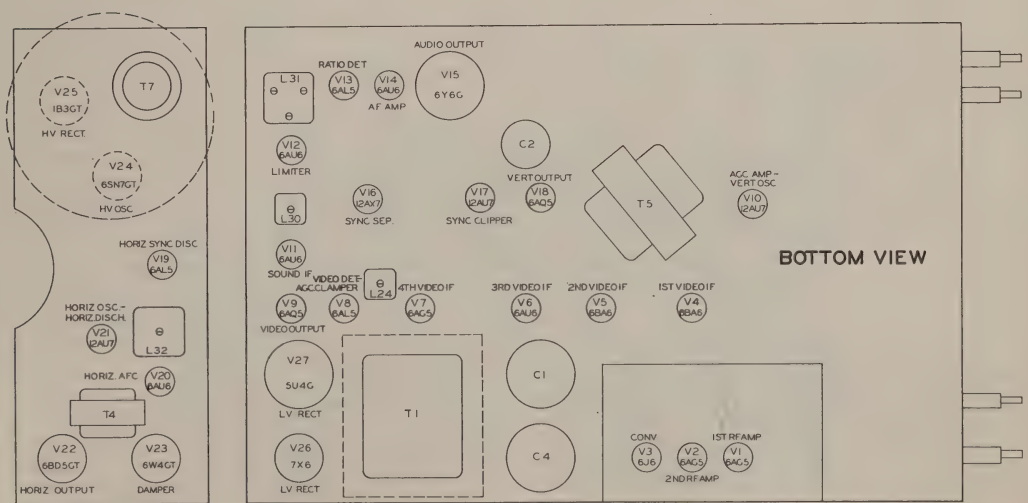

SWITCH SHOWN IN HI BAND POS.
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1950
92-8

CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the high voltage oscillator tube (V24) from its socket.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the junction of R22 and C32, connect the positive lead to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
Note that the common lead of the VTVM used during video IF alignment is -125 volts with respect to chassis, avoid touching or grounding the VTVM case.
Remove the converter tube (V3) and replace it with a 6J6 which has had pin 1 removed.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.005MFD	High side to pin 1 (Grid) of 6AG5 (V7). Low side to chassis.	24MC (10MC SWP)	27.4MC 21.9MC	Any	Vert. Amp. to Point (A). Low side to chassis.	A1, A2	Adjust for response curve similar to Fig 1 with markers as shown.
2.	Direct	High side to ungrounded tube shield floating over converter tube (V3). Low side to chassis.	Not used	20.4MC (Unmod.)	"	Use VTVM. DC Probe and common leads across R41. (See note above)	A3	Adjust for MINIMUM deflection.
3.	Direct	"	"	21.9MC	"	"	A4	"
4.	Direct	"	"	27.9MC	"	"	A5	"
5.	Direct	"	"	26.3MC	"	"	A6	Adjust for maximum deflection.
6.	Direct	"	"	23.4MC	"	"	A7	"
7.	Direct	"	"	25.0MC	"	"	A8	"
8.	Direct	"	"	24.3MC	"	"	A9	"
9.	Direct	"	24MC (10MC SWP)	23.1MC 26.4MC	"	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve similar to Fig 2. If necessary retouch A6 thru A9 for proper response.

4.5MC TRAP ADJUSTMENT

Pre-Set All maximum counter-clockwise, (fully out).

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT • VTVM	ADJUST	REMARKS
10.	.005MFD	High side to pin 7 (Grid) of 6AQ5 (V9). Low side to chassis.	4.1MC (Unmod.)	Any	Connect high frequency probe to pin 1 (cathode) of picture tube (V28). Common to chassis.	A10	Adjust for maximum deflection.
11.	.005MFD	"	4.5MC (max. output).	"	"	A11	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	.005MFD	High side to pin 1 (Grid) of 6AQ5 (V9). Low side to chassis.	4.5MC (1MC SWP)	4.5MC	Any channel not used locally	Vert. Amp. thru 40KΩ to Point (B). Low side to chassis.	A12, A13	Adjust for maximum amplitude and symmetry as per Fig 3.
13.	.005MFD	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A14, A15, A16	Adjust for response curve similar to Fig 4. The response should be linear between 4.45 and 4.55MC.

RF TUNER ALIGNMENT

Connect the three volt bias battery as outlined under video IF alignment.
The two trimmer capacitors located near the front of the tuner are for the purpose of adjusting the antenna input circuit. These trimmers are pre-set and sealed at the factory, they should not be adjusted in the field.
Remove the dummy converter tube and replace the original tube.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

HIGH BAND OSCILLATOR ALIGNMENT

Turn the band selector switch to "high band," (counter-clockwise).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	217.25MC 21.9MC	Turn tuning gang fully open	Vert. Amp. to Point (D). Low side to chassis.	A17	Adjust so the 21.9MC and 217.25MC marker coincide at 100% response as shown in Fig 5.
15.	"	"	177MC (10MC SWP)	177.25MC 21.9MC	Turn tuning gang fully closed	"	L10	Expand or compres coil turns so the 21.9MC and 177.25MC markers coincide at 100% response as shown in Fig 6. Repeat steps 14 and 15 until no further improvement can be made.

HIGH BAND RF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	21.9MC 26.4MC	Turn tuning gang fully open	Vert. Amp. to Point (D). Low side to chassis.	A18, A19	Adjust A18 for maximum amplitude at the 21.9MC point on response curve. Adjust A19 for maximum amplitude at the 26.4MC point on response curve. See Fig 7.
17.	"	"	177MC (10MC SWP)	21.9MC 26.4MC	Turn tuning gang fully closed	"	L6, L8	Expand or compress turns of L6 for maximum amplitude at 21.9MC point on response curve and adjust L8 for maximum amplitude at 26.4MC point on response curve. See Fig 7.

ALIGNMENT INSTRUCTIONS (CONT.)

LOW BAND OSCILLATOR ALIGNMENT

Turn the band selector to "low band", (clockwise).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
18.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	85MC (10MC SWP)	21.9MC 89.25MC	Turn tuning gang fully open	Vert. Amp. to Point (D). Low side to chassis.	L9	Expand or compress coils turns so the 21.9 MC marker and 89.25MC marker coincide at 100% response as shown in Fig 8.
19.	"	"	57MC (10MC SWP)	21.9MC 58.75MC	Turn tuning gang fully closed	"		Check the coincidence of the 21.9MC marker and 58.75MC marker. If they are not within 1/2 MC, it will be necessary to compromise between the high band and low band. There should be no more than 1/2 MC difference between the markers on any channel.

LOW BAND RF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
20.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	85MC (10MC SWP)	21.9MC 26.4MC	Turn tuning gang fully open	Vert. Amp. to Point (D). Low side to chassis.	L5, L7	Expand or compress turns of L5 for maximum response at 21.9MC point on response curve. Adjust turns of L7 for maximum amplitude at 26.4MC point on response curve. Check all low band channels, if the markers fall below 70% or the dip which may appear exceeds 30%, on any channel compromise adjustment of L5 and L7 will be required.

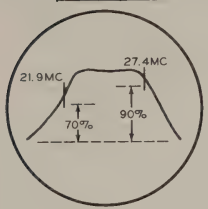


FIG.1

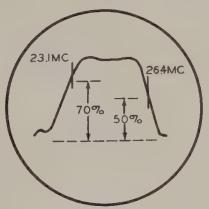


FIG.2

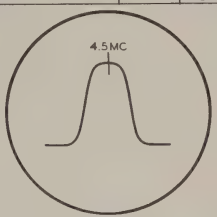


FIG. 3

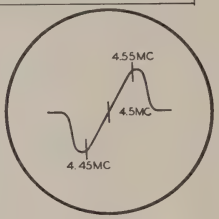


FIG. 4

FIG.5

FIG.6

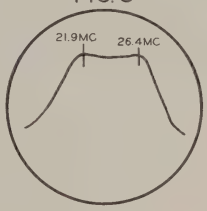
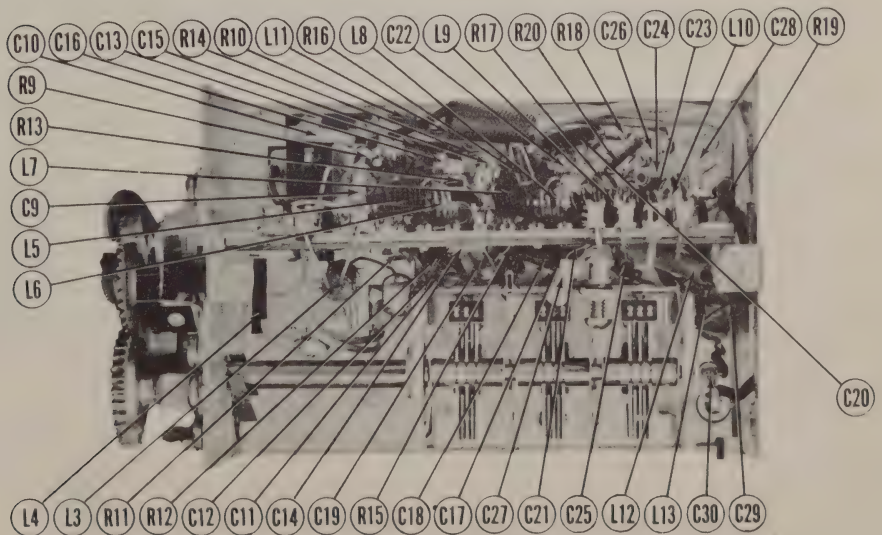


FIG.7

FIG.8



RF TUNER

SYLVANIA MODELS 1-075, 1-113, 1-114, 1-124, 1-125, 1-177

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.2VDC	0V.	6.3VAC	0V.	125VDC	125VDC	0V.		
V 2	6AG5	-.2VDC	1.1VDC	6.3VAC	0V.	143VDC	143VDC	1.1VDC		
V 3	6J6	140VDC	95VDC	0V.	6.3VAC	-3.4VDC	§-3.7VDC	0V.		
V 4	6BA6	-3VDC	0V.	0V.	6.3VAC	120VDC	120VDC	1.4VDC		
V 5	6BA6	-.2VDC	0V.	0V.	6.3VAC	130VDC	130VDC	1.4VDC		
V 6	6AU6	18VDC	0V.	0V.	6.3VAC	175VDC	175VDC	20VDC		
V 7	6AG5	0V.	2.4VDC	0V.	6.3VAC	175VDC	175VDC	2.4VDC		
V 8	6AL5	¶0V.	0V.	6.3VAC	0V.	0V.	0V.	¶-3.2VDC		
V 9	6AQ5	¶-3.2VDC	¶10VDC	0V.	6.3VAC	¶105VDC	¶125VDC	¶-3.2VDC		
V 10	12AU7	¶150VDC	¶-25VDC ¶-55VDC	¶.6VDC	6.3VAC	6.3VAC	63VDC	-12VDC	0V.	0V.
V 11	6AU6	-.1VDC	.5VDC	0V.	6.3VAC	95VDC	95VDC	.5VDC		
V 12	6AU6	-.3VDC	0V.	0V.	6.3VAC	7.7VDC	62VDC	0V.		
V 13	6AL5	.3VDC	0V.	0V.	6.3VAC	.3VDC	0V.	.3VDC		
V 14	6AU6	-.5VDC	0V.	0V.	6.3VAC	125VDC	30VDC	0V.		
V 15	6Y6G	0V.	0V.	145VDC	125VDC	0V.	0V.	6.3VAC	10VDC	
V 16	12AX7	¶250VDC	¶40VDC	¶45VDC	0V.	0V.	¶300VDC	¶40VDC	¶45VDC	6.3VAC
V 17	12AU7	¶20VDC	¶0V.	¶0V.	6.3VAC	6.3VAC	55VDC	.2VDC	0V.	0V.
V 18	6AQ5	¶0V.	¶20VDC ¶32VDC	0V.	6.3VAC	¶290VDC	¶290VDC	¶0V.		
V 19	6AL5	0V.	-7.8VDC	1.2VAC	6.3VAC	.1VDC	0V.	0V.		
V 20	6AU6	-.8VDC	0V.	0V.	6.3VAC	175VDC	175VDC	0V.		
V 21	12AU7	175VDC	-7.3VDC	.1VDC	0V.	0V.	¶125VDC ¶250VDC	¶20VDC	¶35VDC	6.3VAC
V 22	6BD5GT	¶-10VDC	0V.	¶0V.	0V.	*	0V.	6.3VAC	¶290VDC	
V 23	6W4GT	0V.	0V.	*	185VDC	0V.	185VDC	♦	♦	
V 24	6SN7GT	¶-15VDC	¶300VDC	¶2.1VDC	¶-15VDC	¶300VDC	¶2.1VDC	0V.	6.3VAC	
V 25	1B3GT	* DO NOT MEASURE.								
V 26	7X6	6.3VAC	200VDC	210VAC	130VAC	130VAC	210VAC	200VDC	0V.	
V 27	5U4G	0V.	200VDC	0V.	220VAC	0V.	220VAC	0V.	200VDC	
V 28	10MP4	6.3VAC	-100VDC	PIN 11 -80VDC	PIN 12 0V.					

§ TAKEN WITH VACUUM TUBE VOLTMETER.
¶ MEASURED FROM PIN 3 OF V22.
* DO NOT MEASURE.
♦ 6.3 VAC MEASURED ACROSS FILAMENTS.

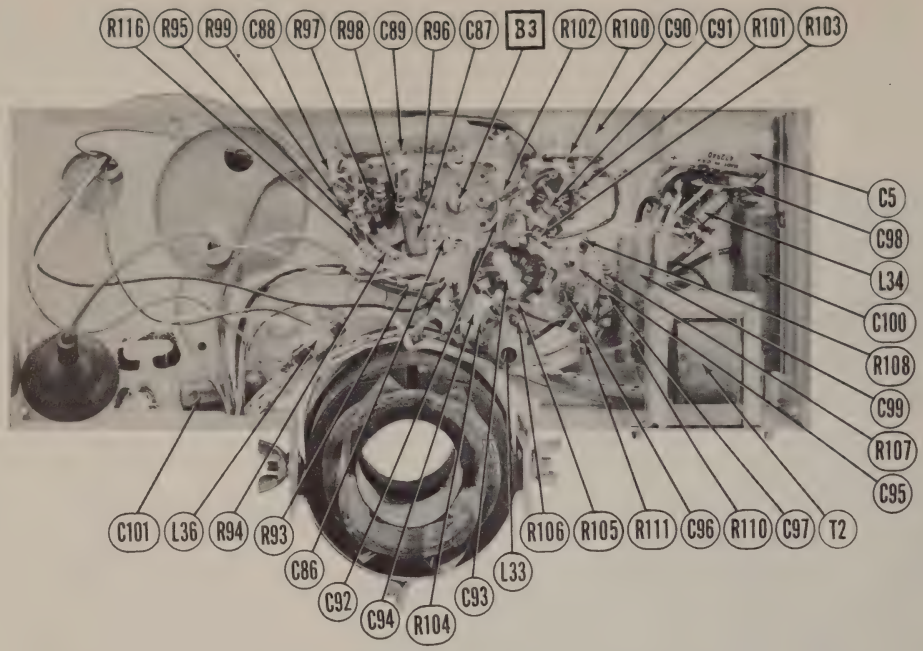
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	120KΩ	0Ω	.1Ω	0Ω	†2.2KΩ	†2.2KΩ	0Ω		
V 2	6AG5	10KΩ	100Ω	.1Ω	0Ω	†1.2KΩ	†1.2KΩ	100Ω		
V 3	6J6	†1000Ω	†10KΩ	0Ω	.1Ω	100KΩ	10KΩ	0Ω		
V 4	6BA6	27KΩ	0Ω	0Ω	.1Ω	†4KΩ	†4KΩ	82Ω		
V 5	6BA6	25KΩ	0Ω	0Ω	.1Ω	†4KΩ	†4KΩ	82Ω		
V 6	6AU6	4.7KΩ	0Ω	0Ω	.1Ω	†380Ω	†380Ω	2.2KΩ		
V 7	6AG5	.5Ω	150Ω	0Ω	.1Ω	†280Ω	†280Ω	150Ω		
V 8	6AL5	¶100Ω	25KΩ	.1Ω	0Ω	0Ω	0Ω	¶4KΩ		
V 9	6AQ5	¶4KΩ	¶1000Ω	0Ω	.1Ω	†17KΩ	0Ω	¶4KΩ		
V 10	12AU7	†320KΩ	¶1.3 Meg. ¶270KΩ	¶1.2KΩ	.1Ω	.1Ω	†14KΩ	¶2.2Meg.	0Ω	0Ω
V 11	6AU6	47KΩ	68Ω	0Ω	.1Ω	†10KΩ	†10KΩ	68Ω		
V 12	6AU6	47KΩ	0Ω	0Ω	.1Ω	†100KΩ	†22KΩ	0Ω		
V 13	6AL5	68KΩ	4Ω	0Ω	.1Ω	Inf.	0Ω	Inf.		
V 14	6AU6	10 Meg.	0Ω	0Ω	.1Ω	†100KΩ	†1.5 Meg.	0Ω		
V 15	6Y6G	0Ω	0Ω	†650Ω	†6KΩ	470KΩ	Inf.	.1Ω	180Ω	
V 16	12AX7	†820KΩ	13KΩ	¶1 Meg.	0Ω	0Ω	†18KΩ	13KΩ	¶2.2 Meg.	.1Ω
V 17	12AU7	†270KΩ	4.8 Meg.	¶0Ω	.1Ω	.1Ω	†22KΩ	†1.5 Meg.	0Ω	0Ω
V 18	6AQ5	¶2 Meg. ¶1 Meg.	¶6KΩ ¶1000Ω	0Ω	.1Ω	†1.8KΩ	†1.8KΩ	¶2 Meg. ¶1 Meg.		
V 19	6AL5	0Ω	1.1 Meg.	2Ω	.1Ω	200KΩ	0Ω	1.1 Meg.		
V 20	6AU6	1.2 Meg.	0Ω	0Ω	.1Ω	†200Ω	†2.4KΩ	0Ω		
V 21	12AU7	†190Ω	100KΩ	10Ω	0Ω	0Ω	†290KΩ †60KΩ	¶2.2 Meg.	¶56KΩ	.1Ω
V 22	6BD5GT	¶10 Meg.	0Ω	¶0Ω	Inf.	†2.3KΩ †360Ω	Inf.	.1Ω	†2.2KΩ †200Ω	
V 23	6W4GT	0Ω	Inf.	†2.3KΩ †360Ω	†120Ω	0Ω	†85Ω	Inf.	Inf.	
V 24	6SN7GT	¶3.9KΩ	†80Ω	¶54Ω	¶4KΩ	†80Ω	¶54Ω	0Ω	.1Ω	
V 25	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP †650Ω
V 26	7X6	.1Ω	32KΩ	190Ω	6Ω	6.5Ω	190Ω	32KΩ	0Ω	
V 27	5U4G	Inf.	32KΩ	Inf.	10.5Ω	Inf.	11Ω	Inf.	32KΩ	
V 28	10MP4	.1Ω	1 Meg.	PIN 11 3.3KΩ	PIN 12 0Ω					

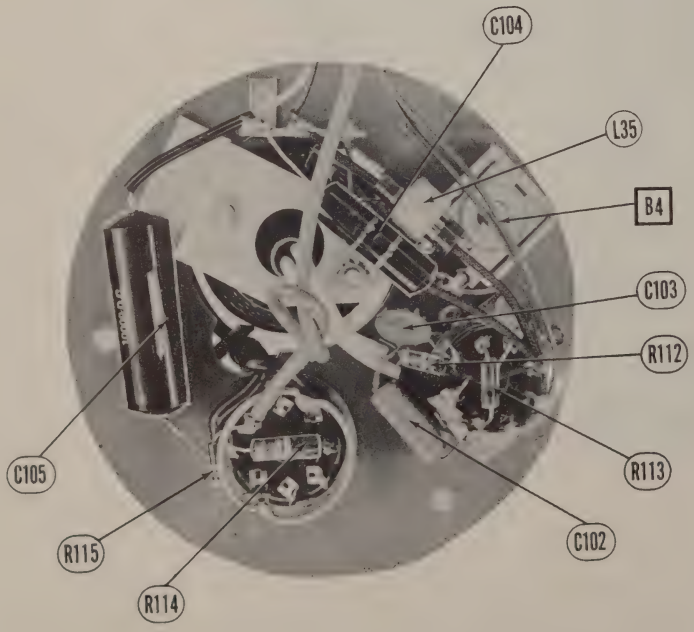
† MEASURED FROM PIN 8 OF V27.
¶ MEASURED FROM PIN 3 OF V22.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

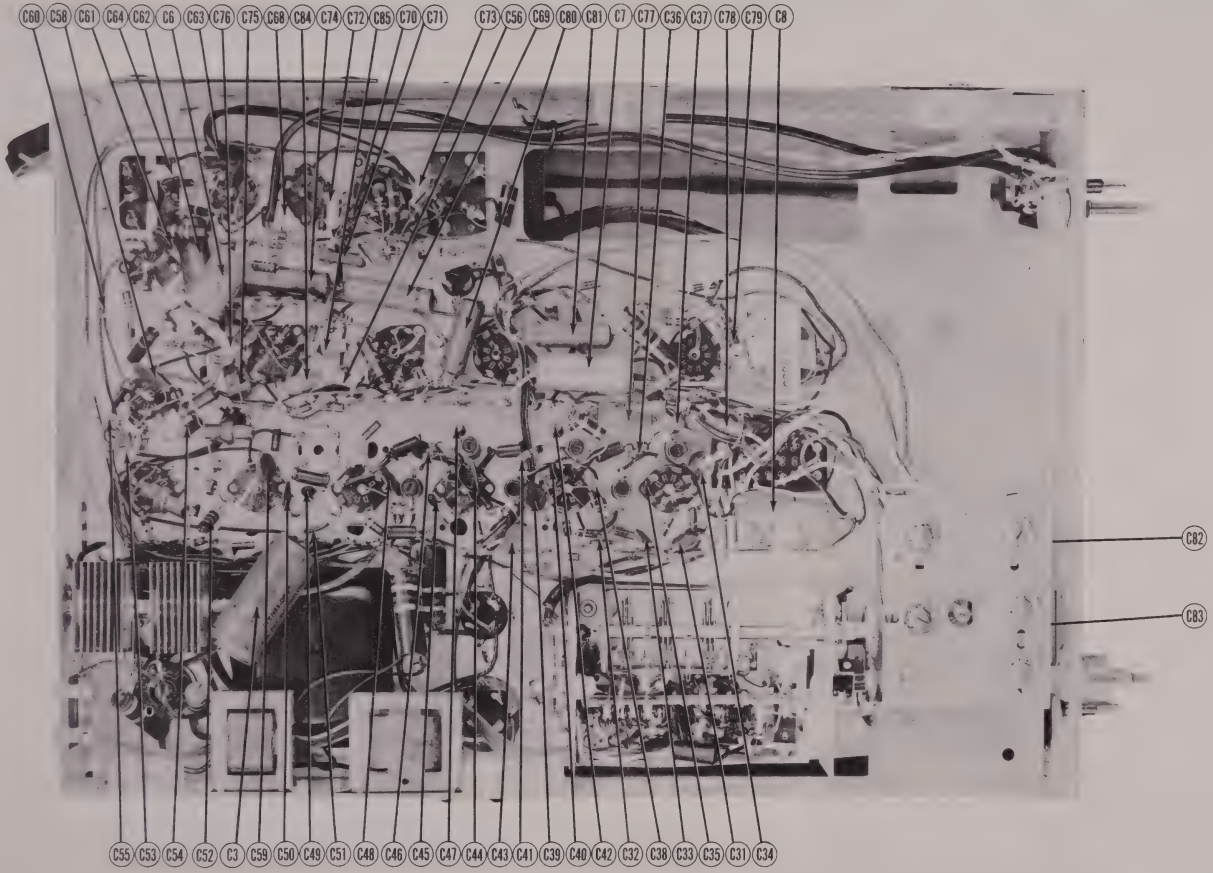
TOR AND ALIGNMENT IDENTIFICATION



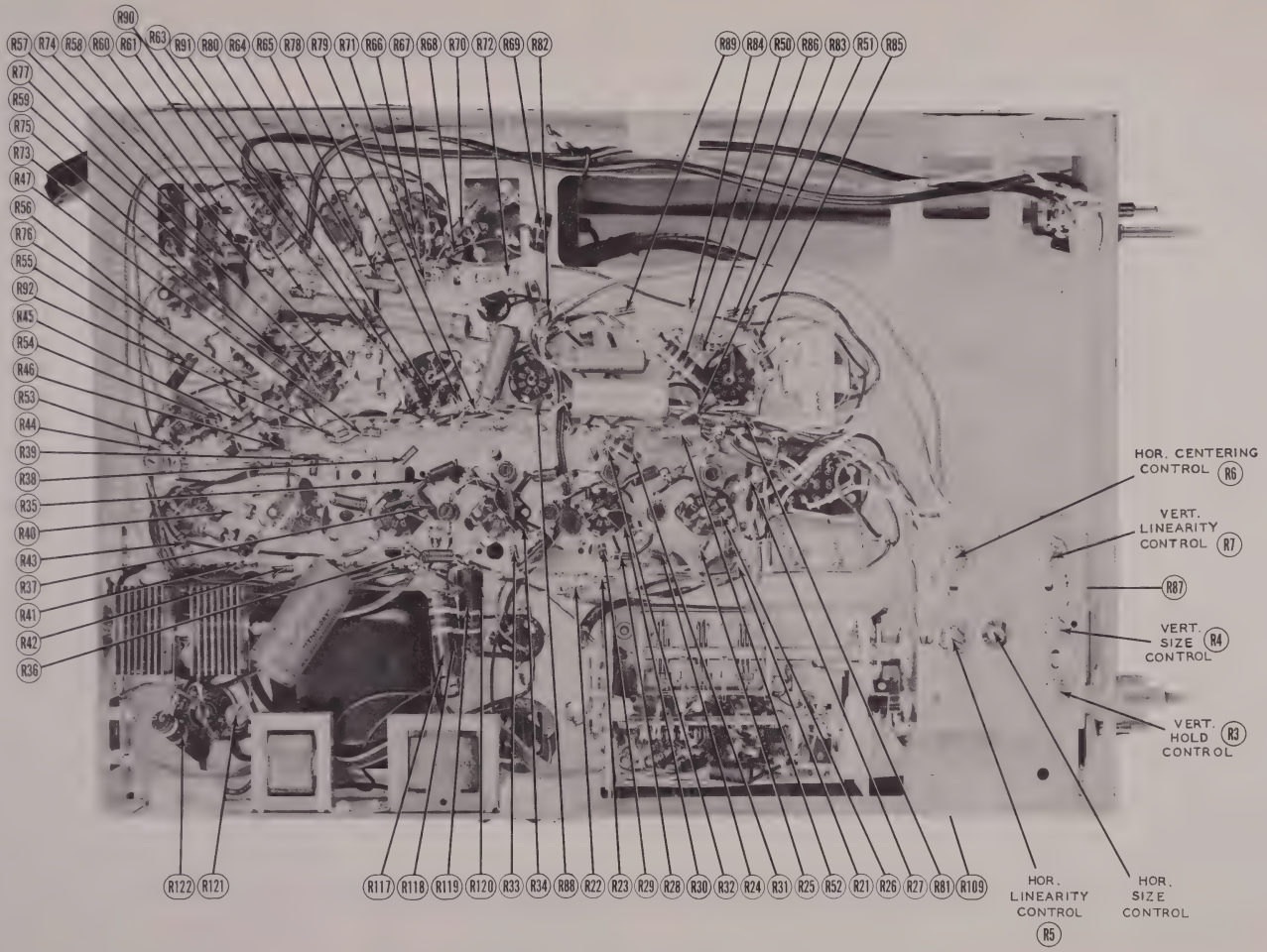
DEFLECTION SUB-CHASSIS



HIGH VOLTAGE SUPPLY-BOTTOM VIEW



CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		SYLVANIA PART No.	STANDARD REPLACEMENT		
V1	1st RF Amp.	623-0001	6AG5	7BD	
V2	2nd RF Amp.	623-0001	6AG5	7BD	
V3	Converter	623-0002	6J6	7BF	
V4	1st Video IF	623-0004	6BA6	7BK	
V5	2nd Video IF	623-0004	6BA6	7BK	
V6	3rd Video IF	623-0005	6AU6	7BK	
V7	4th Video IF	623-0001	6AG5	7BD	
V8	Video Det. - AGC Clamper	623-0003	6AL5	6BT	
V9	Video Output	623-0007	6AQ5	7BZ	
V10	AGC Amp. -Vert. Osc.	623-0006	12AU7	9A	
V11	Sound IF	623-0005	6AU6	7BK	
V12	Limiter	623-0005	6AU6	7BK	
V13	Ratio Det.	623-0003	6AL5	6BT	
V14	AF Amp.	623-0005	6AU6	7BK	
V15	Audio Output	622-0006	6Y6G	7AC	
V16	Sync. Sep.	623-0008	12AX7	9A	
V17	Sync. Clipper	623-0006	12AU7	9A	
V18	Vert. Output	623-0007	6AQ5	7BZ	
V19	Hor. Sync. Disc.	623-0003	6AL5	6BT	
V20	Hor. AFC	623-0005	6AU6	7BK	
V21	Hor. Osc. -Hor. Disch.	623-0006	12AU7	9A	
V22	Hor. Output	622-0007	6BD5GT	6CK	
V23	Damper	633-0004	6W4GT	4CG	
V24	HV Oscillator	622-0005	6SN7GT	8BD	
V25	HV Rectifier	633-0002	1B3GT	3C	
V26	LV Rectifier	632-0003	7X6	7AJ	
V27	LV Rectifier	633-0003	5U4G	5T	
V28A	Picture Tube	642-0001	10MP4	12G	
B	Picture Tube	642-0002	12VP4	12G	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	80	250	161-4001	AF16128F4D		TVL-405	▲ Filter
B	60	250					■ Decoupling
C	40	250					▲ Filter
D	20	150					Output Decoupling
C2A	40	250	161-2001	AF83G4A		TVL-204	■ Filter
B	25	25					▲ Output Cathode Bypass
C3	60	250	161-1003	PRS250/40		EL-6 ♦	Filter
C4A	10	450	161-4000	AF2J2G12E20B		TVL-404	▲ Vert. Output Decoupling
BB	10	300					■ Vert. Osc. Decoupling
C	60	200					▲ Filter
D	100	50					Vert. Output Cathode Bypass
C5	20	250	161-1005	PRS250/20		UT-202	Hor. AFC Screen Bypass
C6	2	50	161-1001	PRS150/4		TVA-12	Stabilizing Cap.
C7	10	12	161-1004	E26A230		TVA-5	AGC Filter
C8	100	50	161-1002	PRS50/100		TVA-17	Hor. Cent. Cont. Bypass
C9	50			GP50M	GP1K-50		RF Coupling
C10	1500			GP1500M	GP2L-0015		AGC Filter
C11	5000			BPD-5	811-005	29C1	1st RF Decoupling
C12	5000			BPD-5	811-005	29C1	1st RF Decoupling
C13	5000			BPD-5	811-005	29C1	1st RF Filament Bypass
C14	13			CN13JNPO	NPOK-13		Fixed Padder
C15	4.7			CI4.7DNPO	NPOK-4.7		Fixed Padder
C16	100			GP100M	GP1K-100		Fixed Padder
C17	5000			BPD-5	811-005	29C1	2nd RF Decoupling
C18	5000			BPD-5	811-005	29C1	2nd RF Decoupling
C19	680			GP680M	GP2K-680		2nd RF Cathode Bypass
C20	5000			BPD-5	811-005	29C1	2nd RF Filament Bypass
C21	14			CN14JNPO	NPOK-14		Fixed Padder
C22	100			GP100M	GP1K-100		RF Coupling
C23	2.2						Osc. Coupling
C24	30			GP30K	GP1K-33		Osc. Grid Cap.
C25	19			CN19JNPO	NPOK-20		Fixed Padder
C26	17.5			CN17.5JNPO	NPOK-17.5		Fixed Padder
C27	10			CN10DNPO	NPOK-10		Fixed Padder *
C28	10			CN10DNPO	NPOK-10		Fixed Trimmer
C29	5000			BPD-5	811-005	29C1	RF Bypass
C30	100			GP100M	GP1K-100		IF Coupling
C31	5000		166-5000D	BPD-5	811-005	29C1	RF Bypass
C32	5000		166-5000D	BPD-5	811-005	29C1	AGC Filter
C33	5000		166-5000D	BPD-5	811-005	29C1	AGC Filter
C34	5000		166-5000D	BPD-5	811-005	29C1	1st V. IF Decoupling
C35	1000		166-1000D	GP1000M	GP2L-001	29C4	1st V. IF Fil. Bypass
C36	.68		168-0004P				IF Coupling
C37	10		166-0010P	CN10DNPO	NPOK-10	MS-41	Fixed Padder
C38	5000		166-5000D	BPD-5	811-005	29C1	AGC Filter
C39	5000		166-5000D	BPD-5	811-005	29C1	2nd V. IF Decoupling
C40	1000		166-1000D	GP1000M	GP2L-001	29C4	2nd V. IF Fil. Bypass
C41	1.5		168-0001P	CI1.5CNPO	NPOK-1.5		IF Coupling
C42	10		166-0010P	CN10DNPO	NPOK-10	MS-41	Fixed Trimmer #
C43	5000		166-5000D	BPD-5	811-005	29C1	Bias Filter
C44A	4000		168-0003D	BPD-5	811-005	36C2	3rd V. IF Decoupling
B	4000			BPD-5	811-005		3rd V. IF Cathode Bypass
C45	1000		166-1000D	GP1000M	GP2L-001	29C4	3rd V. IF Filament Bypass
C46	.68		168-0004P				IF Coupling
C47	6		166-0006P	CN6CNPO	NPOK-6.8		Fixed Trimmer §
C48A	4000		168-0003D	BPD-5	811-005	36C2	4th V. IF Decoupling
B	4000			BPD-5	811-005		4th V. IF Cathode Bypass
C49	1000		166-1000D	GP1000M	GP2L-001	29C4	4th V. IF Fil. Bypass
C50	5000		166-5000D	BPD-5	811-005	29C1	RF Bypass
C51	5000		166-5000D	BPD-5	811-005	29C1	RF Bypass
C52	10		166-0010P	GP10K	NPOK-10	MS-41	V. Diode Filter
C53	5		168-0005P	CN5DNPO	NPOK-5.	MS-55	S.IF Coupling

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SYLVANIA PART No.	AEROVOX PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C54	10		166-0010P	CN10DNPO	NPOK-10	MS-41	Fixed Trimmer
C55	56		166-0056N	CN56JNPO	NPOM-50	MS-45	Fixed Trimmer
C56	10000		168-0002N	GP10000M	821-01	TM-11	Pic. Tube Grid Filter
C57	5000		166-5000D	BPD-5	811-005	29C1	RF Bypass
C58A	4000		168-0003D	BPD-5	811-005	36C2	1st S. IF Decoupling
B	4000			BPD-5	811-005		1st S. IF Cathode Bypass
C59	5000		166-5000D	BPD-5	811-005	29C1	V. Det.-AGC Clamp Fil. Bypass
C60	50		166-0050N	GP50M	GPIK-50	1FM-45	2nd S. IF Grid Filter
C61	5000		166-5000D	BPD-5	811-005	29C1	2nd S. IF Screen Bypass
C62	.2	400	162-0402	P488-22		TC-2	2nd S. IF Plate Decoupling
C63	680		163-0680	GP680M	GP2K-680	1FM-37	De-emphasis
C64	10000		168-0002N	GP10000M	821-01	TM-11	Audio Coupling
C65	50	500	163-0050	1468-00005	GPIK-50	1FM-45	Tone Compensation †
C66	200	500	163-0200	1469-0002	GP2K-200	1FM-32	Tone Compensation †
C67	10000		†	GP10000M	821-01	TM-11	Tone Compensation
C68	10000		168-0002N	GP10000M	821-01	TM-11	Audio Coupling
C69	.1	200	162-0601	P288-1		TM-1	AF Amp. Screen Bypass
C70	100		166-0100P	GP100M	GPIK-100	1FM-31	AF Amp. Plate Bypass
C71	2000		166-2000P	GP2000M	GP2M-002	1FM-22	Tone Compensation †
C72	10000		168-0002N	GP10000M	821-01	TM-11	Audio Coupling
C73	10000		168-0002N	GP10000M	821-01	TM-11	Output Plate DBypass
C74	.1	200	162-0601	P288-1		TM-1	Vert. Sync. Sep. Cathode Bypass
C75	220	500	163-0220	1468-00025	GP2K-220	1FM-325	Vert. Sync. Sep. Plate Bypass
C76	10000		168-0002N	GP10000M	821-01	TM-11	Vert. Sync. Coupling
C77	1000	500	163-1000	1468-001	GP2L-001	1FM-21	Vert. Sync. Coupling
C78	.015	400	162-0415	P488-015			Integrator Net.
C79	250		166-0250P	GP250M	GP2K-250	1FM-325	Vert. Osc. Grid Cap.
C80	.05	200	162-0615	P288-05		TM-15	Decoupling
C81	.1	200	162-0601	P288-1		TM-1	Vert. Discharge
C82	.1	200	162-0601	P288-1		TM-1	Vert. Sweep Coupling
C83	.02	400	162-0612	P488-02		TM-12	Vert. Discharge
C84	.002	600	162-0623	P688-002	GP2M-002	TM-22	Hor. Sync. Sep. Cathode Bypass
C85	500		166-0500P	GP500M	GP2K-500	1FM-35	Hor. Sync. Coupling
C86	100		166-0100P	GP100M	GPIK-100	1FM-31	Hor. Sync. Coupling
C87	.005	400	162-0625	P688-005	811-005	TM-25	Fixed Trimmer
C88	10000		168-0002N	GP10000M	821-01	TM-11	AFC Filter
C89	.2	400	162-0402	P488-22		TC-2	AFC Filter
C90	.015	400	160-42115	P488-015			Fixed Trimmer
C91	100		166-0100P	GP100M	GPIK-100	1FM-31	Phase Shifter
C92	5000		166-5000D	BPD-5	811-005	29C1	Hor. Osc. Grid Cap.
C93	10000		168-0002N	GP10000M	821-01	TM-11	Hor. Sweep Coupling
C94	10000		168-0002N	GP10000M	821-01	TM-11	Hor. Discharge Cathode Bypass
C95	680	500	163-0680		GP2K-680	1FM-37	Hor. Discharge
C96	5000		166-5000D	BPD-5	811-005	29C1	Hor. Discharge Plate Decoupling
C97	1000		166-1000D	GP1000M	GP2L-001	1FM-21	Hor. Sweep Coupling
C98	50	500	162-0050	1468-00005	GPIK-50	1FM-45	RF Bypass
C99	.1	600	162-0601	P688-1		TM-1	Hor. Sweep Coupling
C100	.2	400	162-0402	P488-22		TC-2	RF Bypass
C101	.05	200	162-0615	P288-05		TM-15	Decoupling
C102	1500	500	163-1500	1467-1500	GP2L-0015	1FM-215	Fixed Trimmer
C103	5000		166-5000D	BPD-5	811-005	29C1	HV Osc. Grid Cap.
C104	.022	400	160-42122	P488-022		TM-12	HV Osc. Cathode Bypass
C105	.0005	10000	160-14350			TVM-351	HV Filter

♦ Use mounting strap.
* Some models use 13MMF in this application.
† Items C67 and R62 are combined into one unit obtainable under MFGR'S Part No. 190-0002.
‡ Not used in model 1-177.
# Model 1-177 uses 8MMF in this application. MFGR'S Part No. 166-0008N.
§ Model 1-177 uses 4.7MMF in this application. MFGR'S Part No. 168-0008N.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.		154-0001		70729	Volume Control, panel, tapped at 200KΩ and 350KΩ Note 2
B	1 Meg.					Tone Control, rear-See note 2
R2A	100005	2	155-0003		70910	Contrast Control, panel-Wire Wound-See Note 3
B	100KΩ					Brightness Control-Rear
R3	1 Meg.		153-0001	Q11-137	70819	Vert. Hold Control
R4	1 Meg.		153-0001	Q11-137	70818	Vert. Size Control
R5	500KΩ		153-0002	Q11-133	M-58-S	Horiz. Linearity Control
R6	140Ω	2	153-3002		70824	Horiz. Centering Control, tapped at 70Ω, Wire Wound
R7	5000Ω	2		W-5000	43-5000	Vert. Linearity Control-Wire Wound-See Note 1
R8	2000Ω	2	153-3001	W-2000	70823	Horiz. Size Control-Wire Wound

Note 1. Some models use 1000Ω, 2 watt control, Part No. 153-3000.
Note 2. Model 1-177 does not use a tone control, the volume control Part No. is 152-0007.
Note 3. Model 1-177 use a single contrast control Part No. 153-3003, and a single brightness control Part No. 153-0005.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R9	560Ω				1st RF Grid
R10	150Ω				AGC Network
R11	1200Ω			BTS-1200	1st RF Plate
R12	1000Ω			BTS-1000	1st RF Decoupling
R13	10KΩ				2nd RF Grid
R14	100Ω				2nd RF Cathode
R15	1500Ω			BTS-1500	2nd RF Plate
R16	220Ω 20%				2nd RF Decoupling
R17	5600Ω			BTS-5600	Conv. Grid
R18	100KΩ 20%			BTS-100K	Conv. Grid
R19	10KΩ			BTS-10K	Conv. Plate Decoupling
R20	10KΩ 20%			BTS-10K	Osc. Grid
R21	1000Ω	2	183-0102	BT-2-1000	Decoupling
R22	3.3 Meg.		181-0335	BTS-3.3 Meg.	Voltage Divider
R23	100KΩ		181-0104	BTS-100K	AGC Network
R24	1000Ω 20%		181-0102	BTS-1000	AGC Network
R25	1500Ω		181-0152	BTS-1500	1st Video IF Grid

RESISTO

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	IRC PART N
R26	82Ω		181-0820	
R27	3900Ω	1	182-0392	BTS-390
R28	1000Ω 20%		181-0102	BTS-100
R29	2700Ω		181-0272	BTS-270
R30	82Ω		181-0820	
R31	3900Ω	1	182-0392	BTA-390
R32	39KΩ		181-0393	
R33	15KΩ		181-0153	
R34	2200Ω		181-0222	BTS-220
R35	100Ω 20%		181-0101	
R36	15KΩ		181-0153	
R37	150Ω		181-0151	
R38	100Ω 20%		181-0101	
R39	5600Ω		181-0562	
R40	22KΩ 5%		181-02235	BTS-22K
R41	3900Ω 5%		181-0392	BTS-390
R42	100Ω 20%		181-0101	
R43	68Ω		181-0680	
R44	6800Ω		181-0682	BTS-680
R45	100KΩ 20%	1	182-0104	BTA-100
R46	3300Ω	2	183-0332	BT-2-33
R47	1 Meg. 20%		181-0105	BTS-1 Me
R48	33KΩ		181-0333	BTS-33K
R49	1 Meg.		181-0105	BTS-1 Me
R50	18KΩ 5%	2	183-01835	BT-2-18K
R51	10KΩ 5%	1	182-0103	BTA-10K
R52	22KΩ 5%	1	182-02235	BTA-22K
R53	47KΩ 20%		181-0473	
R54	68Ω		181-0680	
R55	10KΩ 20%	1	182-0103	
R56	47KΩ 20%		181-0473	
R57	39KΩ	1	182-0393	
R58	100KΩ 20%		181-0104	
R59	33KΩ 20%		181-0333	BTS-33K
R60	100KΩ 20%		181-0104	BTS-100K
R61	68KΩ 20%		181-0683	BTS-68K
R62	82KΩ			BTS-82K
R63	10 Meg. 20%		181-0106	BTS-10 M
R64	1.5 Meg. 20%		181-0155	BTS-1.5 M
R65	100KΩ 20%		181-0104	BTS-100K
R66	470KΩ 20%		181-0774	BTS-470
R67	180Ω	1	182-0181	BW-1-180
R68	68Ω		181-0680	
R69	5600Ω	2	183-0562	BT-2-56
R70	22KΩ	1	182-0223	BTA-22K
R71	4700Ω		181-0472	BTS-470
R72	400Ω	5	187-0001	AB-400
R73	10KΩ 20%		181-0103	BTS-10K
R74	18KΩ		181-0183	BTS-18K
R75	10KΩ 20%		181-0103	BTS-10K
R76	820KΩ		181-0824	BTS-820
R77	1 Meg.		181-0105	BTS-1 M
R78	820KΩ		181-0824	BTS-820
R79	3.9 Meg.		181-0395	BTS-3.9
R80	270KΩ		181-0274	BTS-270
R81	270KΩ		181-0274	BTS-270
R82	1200Ω		181-0122	BTS-1200
R83	220KΩ 20%		181-0224	BTS-220
R84	100KΩ 20%		181-0104	BTS-100
R85	22KΩ 20%		181-0223	BTS-22K
R86	3900Ω 5%		181-0392	BTS-390
R87	1 Meg.		181-0105	BTS-1 M
R88	1000Ω 20%		181-0102	BTS-100
R89	1000Ω 20%		181-0102	BTS-100
R90	1.5 Meg.		181-0155	BTS-1.5
R91	22KΩ	1	182-0223	BTA-22K
R92	2.2 Meg.		181-0225	BTS-2.2
R93	100KΩ 5%		181-0104	BTS-100K
R94	33KΩ 5%		181-0333	BTS-33K
R95	10 Meg. 5%		181-0106	BTS-10M
R96	1 Meg. 20%		181-0105	BTS-1 M
R97	100KΩ		181-0104	BTS-100K
R98	100KΩ		181-0104	BTS-100K
R99	1 Meg. 5%		181-01055	BTS-1 M
R100	8200Ω		181-0822	BTS-820
R101	1000Ω 20%		181-0102	BTS-100
R102	2200Ω 20%		181-0222	BTS-220
R103	100KΩ 20%		181-0104	BTS-100K
R104	22KΩ 20%		181-0223	BTS-22K
R105	2.2 Meg. 20%		181-0225	BTS-2.2
R106	56KΩ		181-0563	BTS-56K
R107	39KΩ		181-0393	BTS-39K
R108	4700Ω		181-0472	BTS-470
R109	390KΩ		181-0394	BTS-390
R110	82Ω		181-0820	
R111	10 Meg.		181-0106	BTS-10 M
R112	3900Ω		181-0392	BTS-390
R113	100Ω 20%		181-0101	
R114	3.6Ω			
R115	470KΩ 20%		181-0474	
R116	4.3Ω		189-0007	
R117	390Ω	2	183-0391	
R118	390Ω	1	183-0391	
R119	390Ω	2	183-0391	
R120	390Ω	2	183-0391	
R121	39Ω	1	183-0390	
R122	39Ω	2	183-0390	

Note 4. Some models use 56KΩ resistor in this applica
Note 5. Not used in all models.
Note 6. Items C67 and R62 are combined into one unit,

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SYLVANIA PART No.	AEROVOX PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C54	10		168-0080P	CM10DM1P0	MPCM-10	MS-41	Fixed Trimmer
C55	58		168-0058M	CN56JN0P0	MPCM-50	MS-45	Fixed Trimmer
C56	10000		168-0003N	GP10000M@		821-01	Pic. Tube Grid Filter
C57	5000		168-5000D	BPD-5		811-005	RF Bypass
C58A	4000		168-0003D	BPD-5		811-005	1st S. IF Decoupling
B	4000			BPD-5		811-005	1st S. IF Cathode Bypass
C59	5000		168-5000D	BPD-5		811-005	V. Det.-AGC Clamp Fil. Bypass
C60	50		168-0050M	GP50M	GPSK-50	1FM-45	2nd S. IF Grid Filter
C61	5000		168-5000D	BPD-5		811-005	2nd S. IF Screen Bypass
C62	.2	400	162-0402	P468-32		TC-2	2nd S. IF Plate Decoupling
C63	680		163-0680	GP680M	GP2K-680	1FM-37	De-emphasis
C64	10000		168-0003N	GP10000M		821-01	Audio Coupling
C65	50	500	183-0050	1468-00005	GPSK-50	1FM-45	Tone Compensation †
C66	200	500	183-0200	1469-0002	GP2K-200	1FM-32	Tone Compensation †
C67	10000		†	GP10000M		TM-11	Tone Compensation
C68	10000		168-0003N	GP10000M		821-01	Audio Coupling
C69	.1	200	162-0601	P288-1		TM-11	AF Amp. Screen Bypass
C70	100		168-0001P	GP100M	GPSK-100	1FM-31	AF Amp. Plate Bypass
C71	2000		168-3000GP	GP3M00M	GP3M-003	1FM-23	Tone Compensation †
C72	10000		168-0003N	GP10000M		821-01	Audio Coupling
C73	10000		168-0003N	GP10000M		821-01	Output Plate Dsypass
C74	.1	200	162-0601	P288-1		TM-11	Vert. Sync. Sep. Cathode Bypass
C75	220	500	163-0220	1468-00025	GP2K-220	1FM-325	Vert. Sync. Sep. Plate Bypass
C76	10000		168-0003N	GP10000M		821-01	Vert. Sync. Coupling
C77	1000	500	163-1000	1468-001		1FM-21	Vert. Sync. Coupling
C78	.015	400	162-0415	P488-015			Integrator Net.
C79	250		163-0250P	GP250M	GP2K-250	1FM-335	Vert. Osc. Grid Cap.
C80	.05	200	162-0615	P288-05		TM-15	Decoupling
C81	.1	200	162-0601	P288-1		TM-1	Vert. Discharge
C82	.1	200	162-0601	P288-1		TM-1	Vert. Sweep Coupling
C83	.02	400	162-0613	P488-02		TM-12	Vert. Discharge
C84	.002	500	162-0623	P488-002	GP2M-002	TM-22	Hor. Sync. Sep. Cathode Bypass
C85	500		166-0500P	GP500M	GP2K-500	1FM-35	Hor. Sync. Coupling
C86	100		166-0100P	GP100M	GP1K-100	1FM-31	Hor. Sync. Coupling
C87	.005	400	162-0635	P488-005	811-005	TM-25	Fixed Trimmer
C88	10000		168-0003N	GP10000M	821-01	TM-11	AFC Filter
C89	.2	400	162-0402	P488-23		TC-2	AFC Filter
C90	.015	400	160-41115	P468-015			RF Bypass
C91	100		166-0100P	GP100M	GP1K-100	1FM-31	Phase Shifter
C92	5000		166-5000D	BPD-5	811-005	29C1	Hor. Osc. Grid Cap.
C93	10000		168-0002N	GP10000M	821-01	TM-11	Hor. Sweep Coupling
C94	10000		168-0002N	GP10000M	821-01	TM-11	Hor. Discharge Cathode Bypass
C95	680	500	163-0680		GP2K-680	1FM-37	Hor. Discharge
C96	5000		166-5000D	BPD-5	811-005	29C1	Hor. Discharge Plate Decoupling
C97	1000		166-1000D	GP1000M	GP2L-001	1FM-21	Hor. Sweep Coupling
C98	56	500	163-0056	1468-00005	GP1K-50	1FM-45	RF Bypass
C99	.1	600	162-0601	P688-1		TM-1	Hor. Sweep Coupling
C100	.2	400	162-0402	P488-22		TC-2	RF Bypass
C101	.05	200	162-0615	P288-05		TM-15	Decoupling
C102	1500	500	163-1500	1467-1500	GP2L-0015	1FM-215	Fixed Trimmer
C103	5000		166-5000D	BPD-5	811-005	29C1	HV Osc. Grid Cap.
C104	.022	400	160-42122	P488-022		TM-12	HV Osc. Cathode Bypass
C105	.0005	10000	160-14350			TVM-351	HV Filter

* Use mounting strap.
* Some models use 13MMF in this application.
† Items C67 and R62 are combined into one unit obtainable under MFGR'S Part No. 190-0002.
† Not used in model 1-177.
# Model 1-177 uses 8MMF in this application. MFGR'S Part No. 166-0008N.
‡ Model 1-177 uses 4.7MMF in this application. MFGR'S Part No. 166-0006N.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	1	154-0001		70729	Volume Control, panel, tapped at 200KΩ and 350KΩ Note 2
B	1 Meg.	1				Tone Control, rear-See note 2
R2A	1000Ω	2	155-0003		70810	Contrast Control, panel-Wire Wound-See Note 3
B	100KΩ	2				Brightness Control-Rear
R3	1 Meg.	1	153-0001	QU-137	70819	Vert. Hold Control
R4	1 Meg.	1	153-0001	QU-137	70818	Vert. Size Control
R5	500KΩ	1	153-0002	WL-133	M-58-S	Horiz. Linearity Control
R6	140Ω	2	153-3002		70824	Horiz. Centering Control, tapped at 70Ω, Wire Wound
R7	5000Ω	2		3001	W-5000	Vert. Linearity Control-Wire Wound-See Note 1
R8	2000Ω	2	153-3001	W-2000	70823	Horiz. Size Control-Wire Wound

Note 1. Some models use 1000Ω, 2 watt control, Part No. 153-3000.
Note 2. Model 1-177 does not use a tone control, the volume control Part No. is 152-0007.
Note 3. Model 1-177 use a single contrast control Part No. 153-3003, and a single brightness control Part No. 153-0005.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R9	560Ω	1			1st RF Grid
R10	150Ω	2			AGC Network
R11	1200Ω	2		BTS-1200	1st RF Plate
R12	1000Ω	2		BTS-1000	1st RF Decoupling
R13	10KΩ	2			2nd RF Grid
R14	100Ω	2			2nd RF Cathode
R15	1500Ω	2		BTS-1500	2nd RF Plate
R16	22Ω	20%			2nd RF Decoupling
R17	560Ω	2		BTS-5600	Conv. Grid
R18	100KΩ	20%		BTS-100K	Conv. Grid
R19	10KΩ	2		BTS-10K	Conv. Plate Decoupling
R20	10KΩ	20%		BTS-10K	Osc. Grid
R21	1000Ω	2	183-0102	BT-2-1000	Decoupling
R22	3.3 Meg.	1	181-0335	BTS-3.3 Meg.	Voltage Divider
R23	100KΩ	1	181-0104	BTS-100K	AGC Network
R24	100KΩ	20%	181-0104	BTS-1000	AGC Network
R25	1500Ω	1	181-0152	BTS-1500	1st Video IF Grid

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	IDENTIFICATION CODES
R26	82Ω	1	181-0820		1st Video IF Cathode
R27	3900Ω	1	182-0392	BTS-3900	1st Video IF Decoupling
R28	1000Ω	20%	181-0102	BTS-1000	AGC Network
R29	2700Ω	1	181-0272	BTS-2700	2nd Video IF Transformer Shunt
R30	82Ω	1	181-0820		2nd Video IF Cathode
R31	3900Ω	1	182-0392	BTA-3900	2nd Video IF Decoupling
R32	39KΩ	1	181-0393		IF Trap Coil Shunt
R33	56Ω	1	181-0563		3rd Video IF Transformer Shunt
R34	2200Ω	1	181-0222	BTS-2200	3rd Video IF Cathode
R35	100Ω	20%	181-0101		3rd Video IF Decoupling
R36	15KΩ	1	181-0153		4th Video IF Transformer Shunt
R37	150Ω	1	181-0151		4th Video IF Cathode
R38	100Ω	20%	181-0101		4th Video IF Decoupling
R39	560Ω	1	181-0563		5th Video IF Transformer Shunt
R40	22KΩ	5%	181-02235	BTS-22K-5%	Peaking Coil Shunt
R41	3900Ω	5%	181-0392	BTS-3960-5%	Video Det. Diode Load
R42	100Ω	20%	181-0101		Bias Network
R43	68Ω		181-0680		Video Output Cathode
R44	680Ω	1	181-0682	BTS-6800	Sound Take-Off Coil Shunt
R45	100KΩ	20%	182-0104	BTA-100K	Video Output Plate
R46	3300Ω	2	183-0332	BT-2-3300	Picture Tube Cathode
R47	1 Meg.	20%	181-0105	BTS-1 Meg.	Voltage Divider
R48	33KΩ	1	181-0333	BTS-33K	Voltage Divider-See Note 4
R49	1 Meg.	1	181-0105	BTS-1 Meg.	AGC Amp. Grid-See Note 5
R50	18KΩ	5%	182-02185	BT-2-18K-5%	AGC Amp. Plate
R51	10KΩ	5%	182-0103	BTA-10K-5%	AGC Network
R52	22KΩ	5%	181-02235	BTA-22K-5%	Voltage Divider
R53	47KΩ	20%	181-0473		Sound IF Grid
R54	68Ω	1	181-0680		Sound IF Cathode
R55	10KΩ	20%	182-0103		Sound IF Decoupling
R56	47KΩ	20%	181-0473		Limiter Grid
R57	39KΩ	1	183-0393		Limiter Screen
R58	100KΩ	20%	181-0104		Limiter Plate Decoupling
R59	33KΩ	20%	181-0333	BTS-33K	Voltage Divider
R60	100KΩ	20%	181-0104	BTS-100K	De-emphasis
R61	68KΩ	20%	181-0683	BTS-68K	Disc. Diode Load
R62	82KΩ			BTS-82K	Tone Compensation-See Note 6
R63	10 Meg.	20%	181-0106	BTS-10 Meg.	AF Grid
R64	1.5 Meg.	5%	181-0155	BTS-1.5 Meg.	AF Screen
R65	100KΩ	20%	181-0104	BTS-100K	AF Plate
R66	470KΩ	20%	181-0774	BTS-470K	Output Grid
R67	180Ω	1	182-0181	BW-1-180	Output Cathode
R68	68Ω	1	181-0680		Parasitic Supp.
R69	5600Ω	2	183-0562	BT-2-5600	Bias Network
R70	22KΩ	1	182-0223	BTA-22K	Bias Network
R71	4700Ω	1	181-0472	BTS-4700	Voltage Divider
R72	400Ω	5	187-0001	AB-400	Filter-Wire Wound
R73	10KΩ	20%	181-0103	BTS-10K	Sync. Sep. Grid
R74	18KΩ	1	181-0183	BTS-18K	Sync. Sep. Plate
R75	10KΩ	20%	181-0103	BTS-10K	Sync. Sep. Grid
R76	820KΩ	1	181-0824	BTS-820K	Sync. Sep. Plate
R77	1 Meg.	1	181-0105	BTS-1 Meg.	Bias Network
R78	820KΩ	1	181-0834	BTS-820K	Sync. Clipper Grid
R79	3.9 Meg.	1	181-0395	BTS-3.9 Meg.	Sync. Clipper Grid
R80	270KΩ	1	181-0274	BTS-270K	Sync. Clipper Plate
R81	270KΩ	1	181-0274	BTS-270K	Vert. Osc. Grid
R82	1200Ω	1	181-0122	BTS-1200	Bias Network
R83	220KΩ	20%	181-0224	BTS-220K	Vert. Osc. Plate
R84	100KΩ	20%	181-0104	BTS-100K	Vert. Osc. Plate Decoupling
R85	22KΩ	20%	181-0223	BTS-22K	Vert. Osc. Transformer Shunt
R86	3900Ω	5%	181-0392	BTS-3900-5%	Vert. Peaking
R87	1 Meg.	1	181-0105	BTS-1 Meg.	Vert. Output Grid
R88	1000Ω	20%	181-0102	BTS-1000	Vert. Output Cathode
R89	1000Ω	20%	181-0102	BTS-1000	Vert. Output Decoupling
R90	1.5 Meg.	1	181-0155	BTS-1.5 Meg.	Sync. Clipper Grid
R91	22KΩ	1	182-0223	BTA-22K	Sync. Clipper Plate
R92	2.2 Meg.	1	181-0225	BTS-2.2 Meg.	Bias Network
R93	100KΩ	5%	181-0104	BTS-100K-5%	Bias Network
R94	33KΩ	5%	181-0333	BTS-33K-5%	Voltage Divider
R95	10 Meg.	5%	181-0106	BTS-10Meg.5%	Voltage Divider
R96	1 Meg.	20%	181-0105	BTS-1 Meg.	Horiz. Sync. Disc. Load
R97	100KΩ	1	181-0104	BTS-100K	Horiz. Sync. Disc. Load
R98	100KΩ	1	181-0104	BTS-100K	Horiz. Sync. Disc. Load
R99	1 Meg.	5%	181-01055	BTS-1 Meg. 5%	Horiz. AFC Filter Network
R100	820KΩ	1	181-0824	BTS-820K	Horiz. AFC Filter Network
R101	1000Ω	20%	181-0102	BTS-1000	Horiz. AFC Grid
R102	2200Ω	20%	181-0222	BTS-2200	Horiz. AFC Screen
R103	100KΩ	20%	181-0104	BTS-100K	Horiz. Osc. Grid
R104	22KΩ	20%	181-0223	BTS-22K	Ringing Coil Shunt
R105	2.2 Meg.	20%	181-0225	BTS-2.2 Meg.	Horiz. Discharge Grid
R106	56KΩ	1	181-0563	BTS-56K	Horiz. Discharge Cathode
R107	39KΩ	1	181-0393	BTS-39K	Horiz. Discharge Plate
R108	4700Ω	1	181-0472	BTS-4700	Horiz. Peaking
R109	390KΩ	1	181-0394	BTS-390K	Voltage Divider
R110	82Ω	1	181-0820		Parasitic Supp.
R111	10 Meg.	1	181-0106	BTS-10 Meg.	Horiz. Output Grid
R112	3900Ω	1	181-0392	BTS-3900	HV Osc. Grid
R113	100Ω	20%	181-0101		Parasitic Supp.
R114	3.6Ω				HV Rect. Filament-Wire Wound
R115	470KΩ	20%	181-0474		HV Filter
R116	4.3Ω		189-0007		Horiz. Disc. Filament-Wire Wound
R117	390Ω	2	183-0391		Surge Limiter
R118	390Ω	2	183-0391		Surge Limiter
R119	390Ω	2	183-0391		Surge Limiter
R120	390Ω	2	183-0391		Surge Limiter
R121	39Ω	3	183-0390		Surge Limiter
R122	39Ω	2	183-0390		Surge Limiter

Note 4. Some models use 56KΩ resistor in this application.
Note 5. Not used in all models.
Note 6. Items C67 and R62 are combined into one unit, obtainable under MFGR'S Part No. 190-0002

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ② 2.19A	530VCT ② .330 ADC & 360VCT ② .200 ADC	5VAC ② 3A	6.3VAC ② 11.8A	141-0008			

TRANSFORMER (ISOLATION)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T2	6.3VAC ② 1.66A	6.3VAC ② 1.2A			240-0001		F-2944	

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T3	176Ω	575Ω	242-0001	A-8111	A-3000	TSO-1	Vert. Block Osc. Trans.
T4	160Ω		241-0002				Hor. Output Choke
T5	120Ω 620Ω Tap ② 6.1Ω		241-0001	A-8112 ②	A-3037	TSO-5	Vert. Output Trans.
T6A	36Ω		100-0001				Hor. Deflection Coil
B	60Ω						Vert. Deflection Coil

② Drill one new mounting hole.

TRANSFORMER (H.V. OSC.)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T7	1.5Ω	570Ω	16Ω	6Ω	143-0010			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T8	2.6KΩ	3.5Ω	250Ω	.5Ω	143-0009	A-3849	A-3018	RO-305

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA SYLVANIA PART No.	JENSEN PART No.	OLIAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.				
SP1A	PM	3.5Ω	539-0500	ST-803 ③ MOD. P52S-V	SP.A1 ④	③ Remount output transformer
B	PM		539-0800	ST-117 ③ MOD. P8-T	8A51 ③	
	CONE DIA.	V. C. DIA.				
SP2	5"	3/4"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (@ CURRENT 1000 uA)	REPLACEMENT DATA SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.130A	22.5Ω	.6 Henry	145-0001	C-2326 ②		TR-3300	② Drill one new mounting hole.
L2	.200A	60Ω	1.1 Henry	145-0002		C-2994	TR-4200	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SYLVANIA PART No.	MEISSNER PART No.	NOTES
L3	Ant. Coil	0Ω				Low-Band. Part of tuner.
L4	Ant. Coil	0Ω				High Band. Part of tuner.
L5	RF Coil	0Ω				Low-Band. Part of tuner.
L6	RF Coil	0Ω				High-Band. Part of tuner.
L7	RF Coil	0Ω				Low-Band. Part of tuner.
L8	RF Coil	0Ω				High-Band. Part of tuner.
L9	Osc. Coil	0Ω				Low-Band. Part of tuner.
L10	Osc. Coil	0Ω				High-Band. Part of tuner.
L11	Fil. Choke	0Ω				Part of tuner.
L12	RF Choke	0Ω				Part of tuner.
L13	1st Video IF	.5Ω				Part of tuner.
L14	Fil. Choke	0Ω		147-0014		
L15	Fil. Choke	0Ω		147-0014		

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF) CONT.

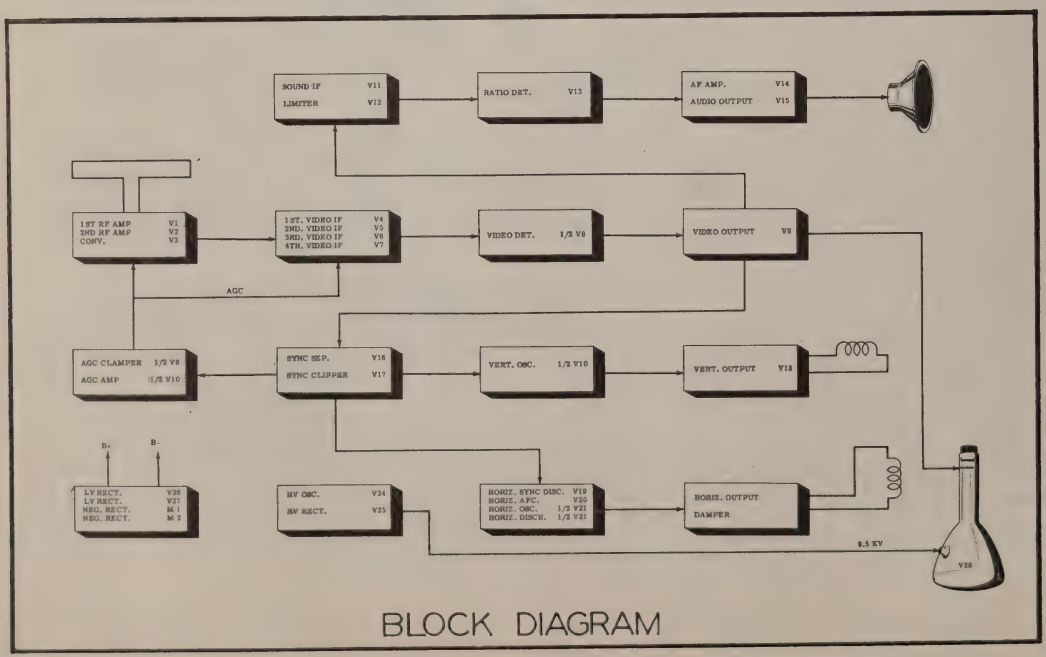
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SYLVANIA PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L16	Adjacent Channel Picture Trap	.1Ω		118-0003		
L17	2nd Video IF	.5Ω	.5Ω	125-0001		
L18	Fil. Choke	0Ω		147-0014		
L19	Sound Trap	.1Ω		118-0003		
L20	3rd Video IF	.5Ω	.5Ω	125-0001		
L21	Fil. Choke	0Ω		147-0014		
L22	Adjacent Channel Sound Trap	.1Ω		118-0003		
L23	4th Video IF	.5Ω	.5Ω	125-0001		
L24	5th Video IF	.3Ω	1.1Ω	120-0002		
L25	Fil. Choke	0Ω		147-0014		
L26	Peaking	5Ω		146-0001		
L27	Peaking	7.6Ω		146-0002		
L28	Sound Take-Off & 4.5MC Trap	1.5Ω	5Ω	129-0001		
L29	Peaking	6.8Ω		146-0004		
L30	Sound IF	2.1Ω	2.1Ω	120-0001		
L31	Ratio Det. Transformer	2Ω	4.1Ω *	128-0002		* Resistance of entire secondary.
L32	Horiz. Sync. Disc. Trans.	66Ω	38Ω	128-0001		Other secondary resistance is 10Ω
L33	Ringing Coil	36Ω		146-0005		
L34	RF Choke	0Ω		147-0014		
L35	HV Osc. Cath. Choke	53Ω		146-0006		
L36	Decoupling Choke	53Ω		146-0006		

SELENIUM RECTIFIER

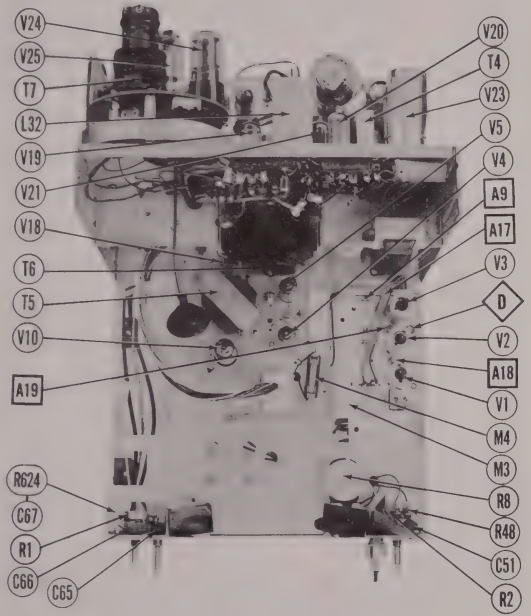
ITEM No.	RATING CURRENT	REPLACEMENT DATA SYLVANIA PART No.	REPLACEMENT DATA SYLVANIA PART No.		NOTES
M1	.200A	517-0001	NF-5		
M2	.200A	517-0001	NF-5		

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M3	RF Tuner	323-0001	
M4	Fuse	191-0005	Type AGC, .25A
M5	Ion Trap	400-0002	Permanent Magnet
M6	Switch	571-0001	On-Off
M7	Ant. Assembly	582-0002	
M8	Focus Magnet Assembly	400-0001	
	Knob	743-0001	Channel Assembly
	Knob	740-0001	Inner-Shaft
	Knob	744-0005	Outer-Shaft



BLOCK DIAGRAM



CHASSIS-TOP VIEW

HORIZONTAL LINEARITY ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.
Turn the horizontal size control until the picture is of proper width.
Turn the horizontal linearity control fully counter-clockwise, and then slowly clockwise until crowding is observed in the center of the picture. Then carefully turn the control counter-clockwise just enough to remove the crowding. On some sets the crowding may not be observed, in this case turn the control to maximum clockwise and leave it there. Caution: Do not operate the set for any length of time with this control incorrectly adjusted. Check the setting of the horizontal linearity control frequently during horizontal oscillator alignment.

HORIZONTAL OSCILLATOR ALIGNMENT

HORIZONTAL OSCILLATOR CHECK

a) Turn the set on and tune in a TV signal, preferably a test pattern. The picture should pull into sync.
b) Momentarily remove the signal by tuning to another channel and back again, the picture should fall back into sync.
c) Turn the set off for about 5 minutes, upon turning the set back on the picture should immediately fall back into sync.

SLIGHT RETOUCH ADJUSTMENT

If the oscillator failed any of the above check, it may be possible to correct it with a slight retouch adjustment as follows:
1) Remove the horizontal discriminator tube (V19) from its socket.
2) Adjust the horizontal frequency slug (B1) until the picture moves slowly back and forth across the screen with the blanking bar vertical.
3) Replace the horizontal discriminator tube (V19) in its socket.
4) Repeat the horizontal oscillator check, if the oscillator does not synchronize properly procede with complete horizontal oscillator alignment.

COMPLETE HORIZONTAL OSCILLATOR ALIGNMENT

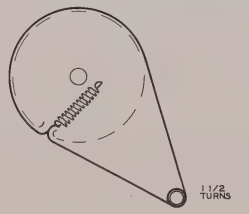
a) Turn the core of the "ringing" coil (B2) fully out, (counter-clockwise), and short R108.
b) Remove the horizontal discriminator tube (V19) from its socket.
c) Adjust B1 until the picture moves slowly back and forth across the screen with the blanking bar vertical.
d) Replace V19 in its socket.
e) Turn the horizontal centering control until the edge of the picture can be seen. Turn the contrast down and the brightness up until the normally blanked edge of the raster is visable.
f) Adjust the horizontal phasing slug (B3) until the blanking bar is approximately 1/8 inch wide.
g) Remove the short from R108 and readjust the horizontal linearity control as outlined under "HORIZONTAL LINEARITY ADJUSTMENTS".
h) Adjust B2 until 1/8 inch of blanking bar is again visable.
Check the oscillator pull in range as follows:
Turn B1 until the picture falls out of sync.
Slowly turn B1 back towards its original position and carefully note the number of bars present just before the picture falls back into sync. Repeat this check for both directions of rotation. If the number of bars present just before synchronization is less than 3 or more than 4 at either end of the pull in range, repeat the complete horizontal oscillator alignment. After completing this check, perform the slight retouch adjustment above.
Repeat the horizontal oscillator check.

HIGH VOLTAGE OSCILLATOR ADJUSTMENTS

Turn the contrast and brightness control to minimum.
Make sure the high voltage power supply cover is properly in place, and turn the high voltage trimmer (B4) to minimum capacity, (fully out).
Connect the high voltage probe of a VTVM to the high voltage lead from the power supply, connect the common lead to chassis. Turn B4 clockwise an d observe the reading on the meter, a peak voltage of approximately 18KV should be reached. Continue turning B4 clockwise until the meter reads 9.5KV, this is the proper setting for B4.
NOTE: The high voltage supply will provide a greatly reduced output if the high voltage fuse is blown.

DISASSEMBLY INSTRUCTIONS (MODEL 1-075)

1. Remove four push-on type control knobs. NOTE: Only outer knob of power switch comes off.
2. Remove six screws holding rear cover. Drop cover on hinges or remove staples holding hinges and remove cover completely.
3. Loosen antenna terminal screws. Remove built-in antenna leads.
4. Remove screw holding clamp over speaker corner . Remove clamp.
5. Remove six 5/16" hex head bolts holding chassis. Remove chassis.



CHANNEL SELECTOR DRIVE CORD STRINGING

PHOTOFACT* Folder

VIDEOLA MODELS

VS-160, VS-161, VS-165, VS-167, VS-168

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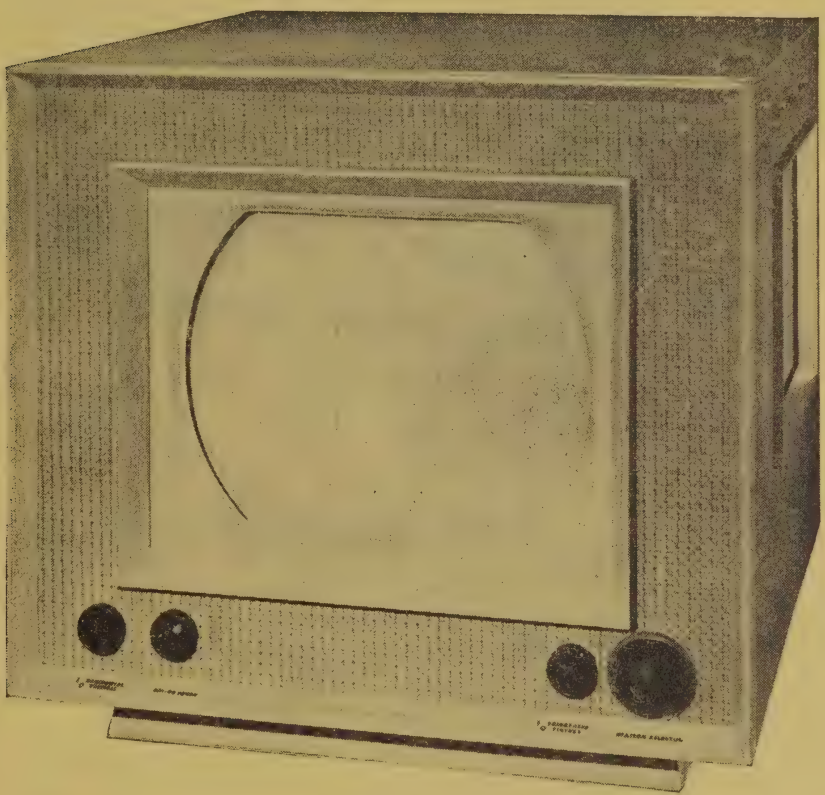

MODEL VS-160

VIDEOLA MODELS
VS-160, VS-161, VS-165, VS-167, VS-168

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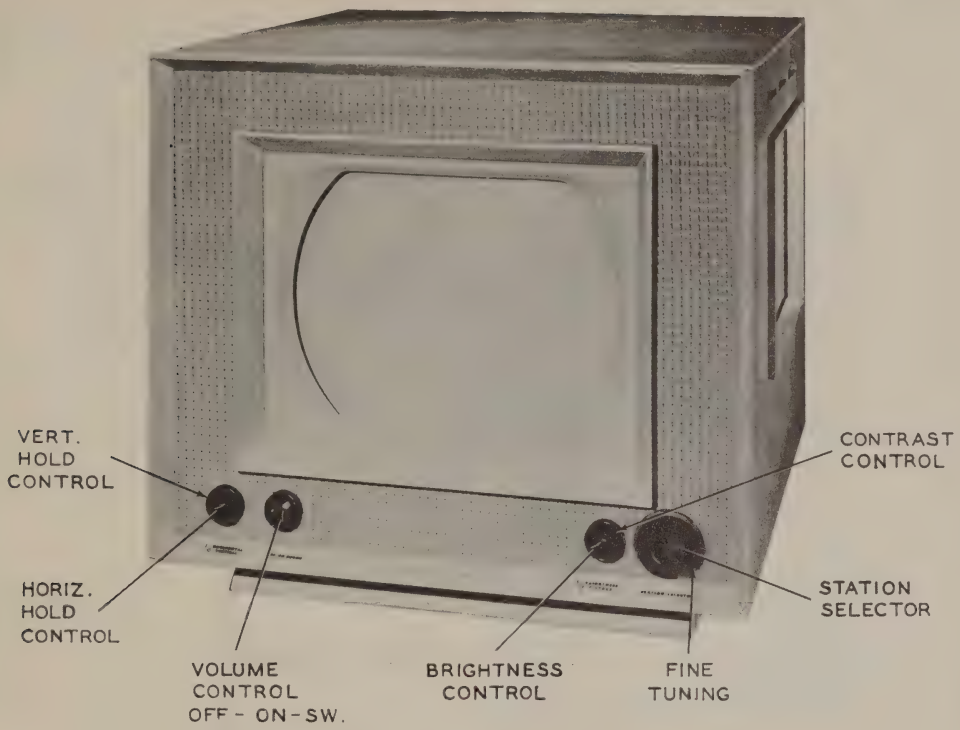
VIDEOLA MODELS VS-160, VS-161, VS-165, VS-166, VS-167, VS-168



VIDEOLA MODELS VS-160, VS-161, VS-165, VS-166, VS-167, VS-168

VIDEOLA MODEL VS-160

TRADE NAME	Videola Models VS-160, VS-161, VS-165, VS-166, VS-167, VS-168
MANUFACTURER	Video Corp. of America, 229 W. 28th St., New York 1, New York
TYPE SET	Television Receiver
TUBES	Nineteen
POWER SUPPLY	110-120 Volts AC - 60 Cycle
RATING	1.98 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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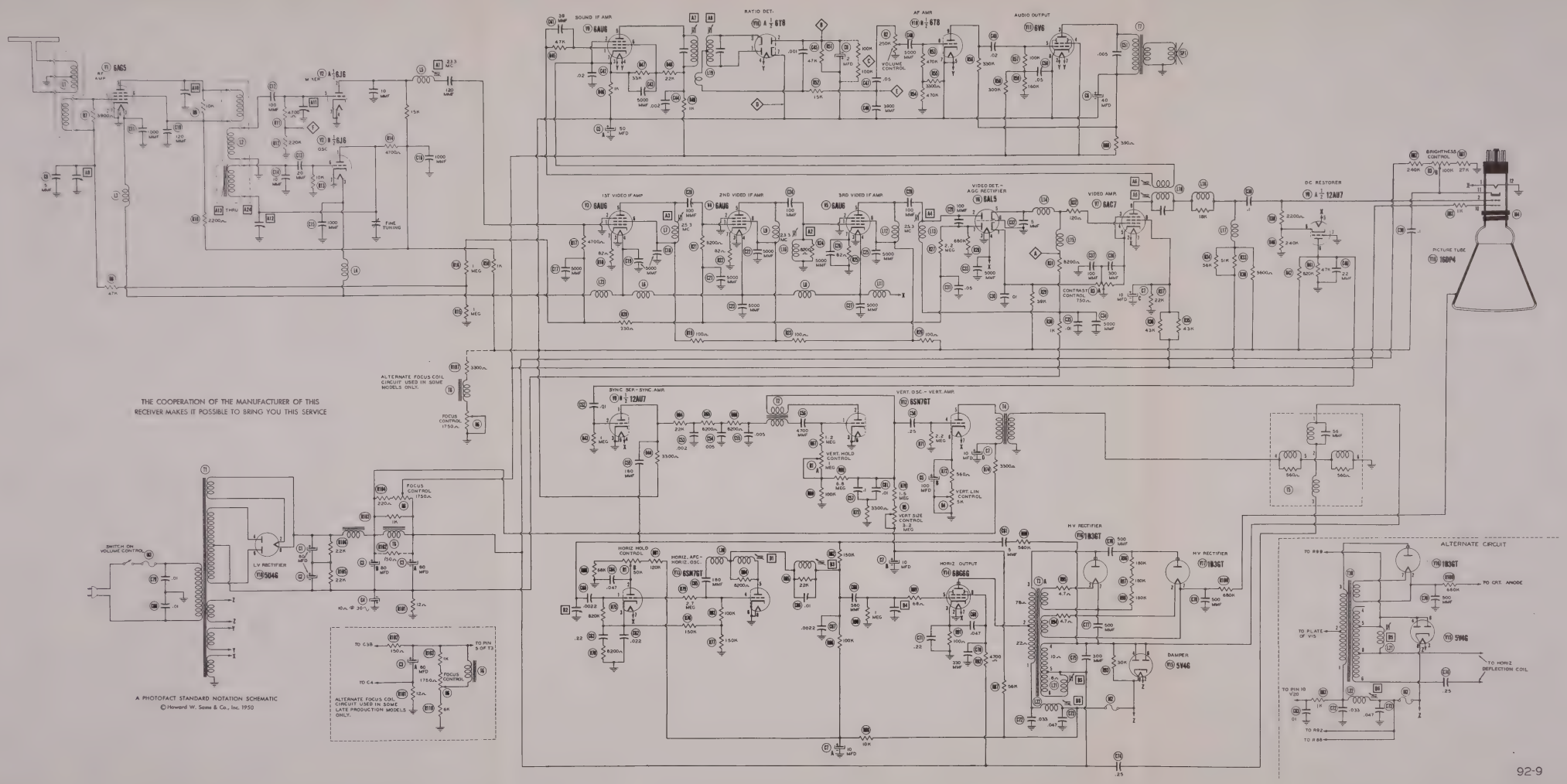
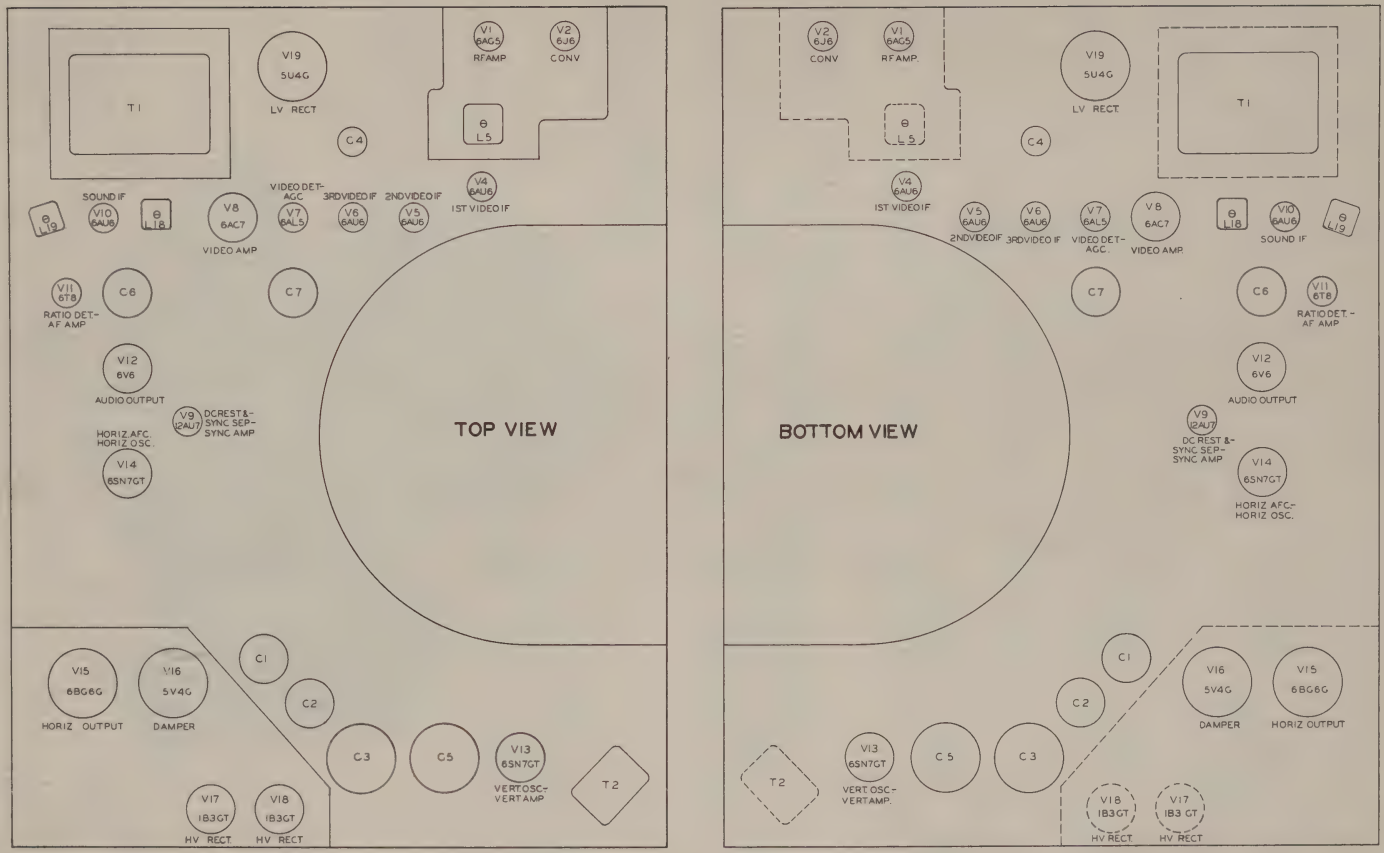
DATE 4-50 SET 92 FOLDER 9


THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1950
SOUND IF AMR
RATIO DET.
AF AMR
AUDIO OUTPUT
1ST VIDEO IF AMP
2ND VIDEO IF AMP
3RD VIDEO IF AMP
VIDEO DET.-AGC RECTIFIER
VIDEO AMP.
DC RESTORER
PICTURE TUBE
SYNC SEP.-SYNC AMR
VERT. OSC.-VERT. AMP.
HORIZ. HOLD CONTROL
HORIZ. AFC-HORIZ. OSC.
HORIZ. OUTPUT
H.V. RECTIFIER
DAMPER
L.V. RECTIFIER
ALTERNATE FOCUS COIL CIRCUIT USED IN SOME MODELS ONLY.
ALTERNATE CIRCUIT
92-9

CHASSIS TOP VIEW

CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



TUBE PLACEMENT CHART

VIDEOLA MODELS VS-160, VS-161, VS-165, VS-166, VS-167, VS-168

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V13) from its socket.

VIDEO IF ALIGNMENT

Turn the contrast control to maximum clockwise.
Note that during video IF alignment the common lead of the VTVM is connected to approximately -2.5 volts, avoid grounding the VTVM case.
Remove the channel 13 segment of the converter section of the tuner turret and turn the channel selector switch to channel 13, to disable the local oscillator.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over converter tube (V2). Low side to chassis.	23.3MC (Unmod.)	Any	DC Probe & Common leads across R31	A1, A2	Adjust for maximum deflection.
2.	Direct	"	25.3MC	"	"	A3, A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to ungrounded tube shield floating over converter tube (V2). Low side to chassis.	24MC (10MC SWP)	21.25MC 22.9MC 23.4MC 24.9MC 25.75MC	Any	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve similar to Fig 1. If necessary retouch A1 thru A4 for optimum response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

During sound IF alignment the common lead of the VTVM is connected to approximately 140 volts with respect to chassis, avoid grounding or touching the VTVM case.
Connect a matched pair of 100KΩ resistors between Points (B) and (D). The junction of these two resistors is alignment Point C.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.001MFD	High side to pin 4 (Grid) of 6AC7 (V7). Low side to chassis.	4.5MC (Unmod.)	Any channel not used locally	DC Probe to Point (B). Common to Point (D).	A5, A6, A7	Adjust for maximum deflection.
5.	.001MFD	"	"	"	DC Probe to Point (E). Common to Point (C).	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal 3with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.001MFD	High side to pin 4 (Grid) of 6AC7 (V7). Low side to chassis.	4.5MC (450KC Sweep)	4.5MC	Any channel not used locally	Vert. Amp. to Point (B) Low side to chassis.	A5, A6 A7	Disconnect stabilizer capacitor C8. Adjust for maximum amplitude and symmetry as per Fig 2.
5.	.001MFD	"	"	"	"	Vert. Amp. to Point (E). Low side to chassis.	A8	Reconnect capacitor C8. Adjust A8 so 4.5MC occur at center of crossover lines as per Fig 3. Slightly retouch A7 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT

Replace the channel 13 segment of the tuner turret.
The sweep generator output lead should be terminated with its characteristic impedance usually 50 ohms.
Turn the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon res.	Across antenna leads with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (E). Low side to chassis.	A9, A10, A11	Adjust for flat-topped response similar to Fig 4 with markers above 70%.
7.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check all channels for response similar to Fig 4. If markers fall below 70% on any channel, make slight adjustment of A9, A10, A11 with channel selector set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC1 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

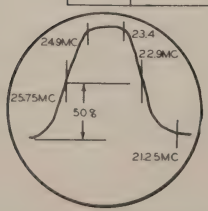


FIG. 1

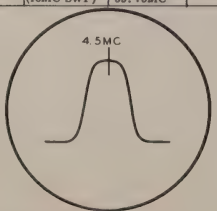


FIG. 2

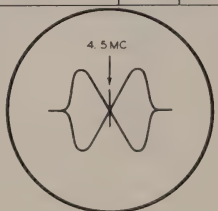


FIG. 3

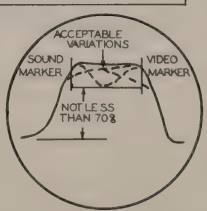


FIG. 4

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Complete oscillator alignment may not be necessary.

If the oscillator seems to be off frequency approximately the same amount, for a majority of the channnels, it may be possible to correct them in one step using A12. If should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel.

If adjustment of A12 will not bring all channels within the range of the fine tuning control it will be necessary to use the individual channel oscillator adjustments for each channel that is off frequency (step 8).

The individual channel oscillator adjustments are reached through a hole just to the right of the channel switch shaft.

The correct adjustment screw is accessible through this hole as the channel selector is turned to each channel.

Set the fine tuning control to the mid-position of its range.

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point (A). Low side to chassis.	A13	Adjust to place sound markers as shown in Fig 5. The video marker should be at 50%.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A14	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A15	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A16	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A17	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A18	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A19	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A20	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A21	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A22	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A23	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A24	

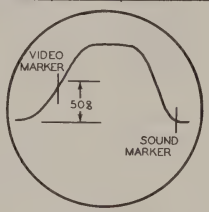
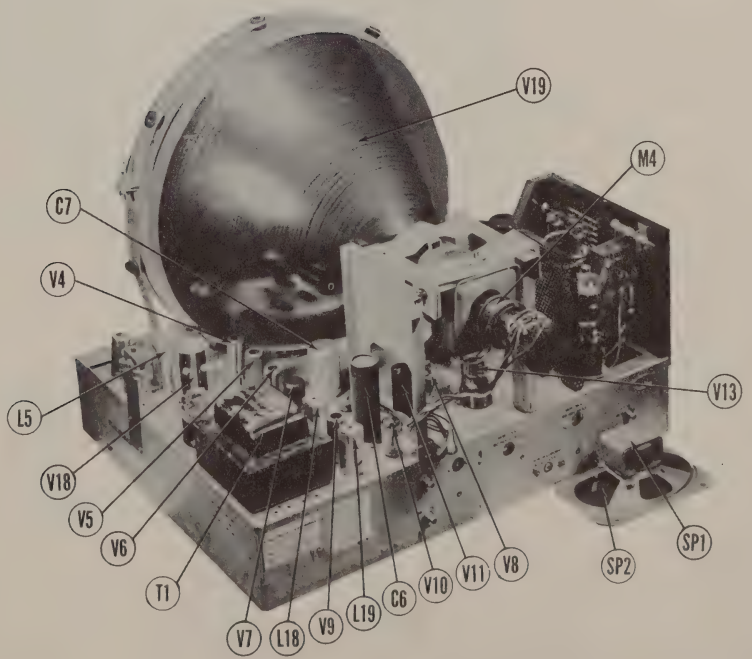


FIG. 5



CHASSIS-TOP VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.4VDC	0V.	6.3VAC	0V.	100VDC	100VDC	0V.		
V 2	6J6	90VDC	80VDC	6.3VAC	0V.	§-1.8VDC	-2.5VDC	0V.		
V 3	6AU6	-.2VDC	0V.	0V.	6.3VAC	133VDC	133VDC	.8VDC		
V 4	6AU6	-.2VDC	0V.	0V.	6.3VAC	133VDC	133VDC	.7VDC		
V 5	6AU6	0V.	0V.	0V.	6.3VAC	135VDC	135VDC	.9VDC		
V 6	6AL5	2.4VDC	-2.9VDC	0V.	6.3VAC	-2.7VDC	0V.	-.1VDC	155VDC	
V 7	6AC7	0V.	6.3VAC	.1VDC	-2.7VDC	.1VDC	173VDC	0V.		
V 8	12AU7	100VDC	-.4VDC	0V.	6.3VAC	6.3VAC	6.6VDC	0V.	1.6VDC	0V.
V 9	6AU6	†6VDC	†10VDC	6.3VAC	†0V.	205VDC	105VDC	10VDC		
V 10	6T8	†-.4VDC	†-.6VDC	†-.4VDC	†0V.	†6.3VAC	0V.	†0V.	†-.4VDC	†85VDC
V 11	6V6GT	†-5.4VDC	†6.3VAC	†177VDC	†270VDC	†-.4VDC	†-.1VDC	†0V.	†0V.	
V 12	6SN7GT	-30VDC	60VDC 130VDC	0V.	0V.	400VDC	8VDC 20VDC	6.3VAC	0V.	
V 13	6SN7GT	-15VDC	155VDC	0V.	-30VDC	170VDC	0V.	6.3VAC	0V.	
V 14	6BG6G	0V.	0V.	12VDC	280VDC	0V.	0V.	6.3VAC	280VDC	TOP CAP *
V 15	5V4G	0V.	390VDC	340VDC	340VDC	390VDC	340VDC	320VDC	390VDC	
V 16	1B3GT	* DO NOT MEASURE.								
V 17	1B3GT	* DO NOT MEASURE.								
V 18	5U4G	0V.	410VDC	0V.	420VAC	0V.	420VAC	0V.	410VDC	
V 19	16DP4	6.3VAC	1.3VDC	PIN 10 340VDC	PIN 11 25VDC	PIN 12 0V.				

§ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.
† MEASURED FROM PIN 8 OF V11.

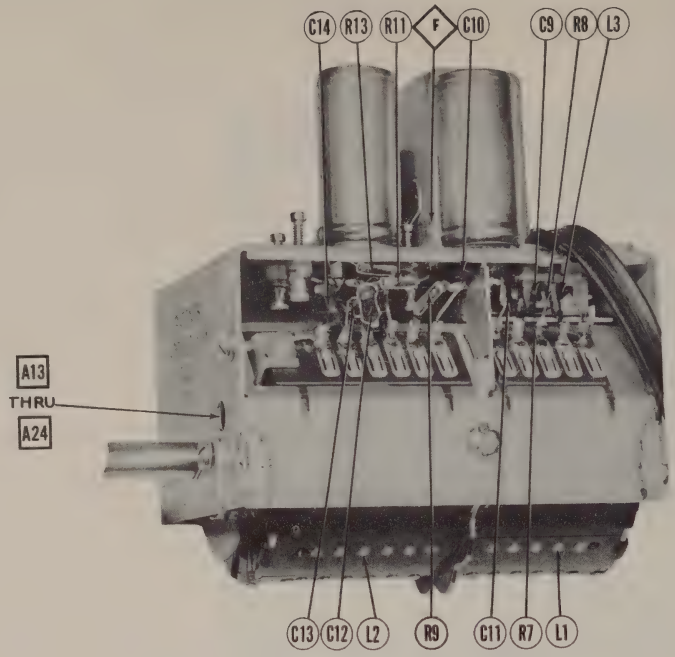
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	1 Meg.	0Ω	.1Ω	0Ω	†3.2KΩ	†3.2KΩ	0Ω		
V 2	6J6	†5.7KΩ	†16KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6AU6	1.2 Meg.	0Ω	0Ω	.1Ω	†300Ω	†300Ω	82Ω		
V 4	6AU6	1.2 Meg.	0Ω	0Ω	.1Ω	†200Ω	†200Ω	82Ω		
V 5	6AU6	.2Ω	0Ω	0Ω	.1Ω	†100Ω	†100Ω	82Ω		
V 6	6AL5	750Ω	1000Ω	0Ω	.1Ω	9.2KΩ	0Ω	600KΩ		
V 7	6AC7	0Ω	.1Ω	8Ω	9.3KΩ	8Ω	22KΩ	0Ω	†5.6KΩ	
V 8	12AU7	†3.3KΩ	1 Meg.	0Ω	.1Ω	.1Ω	47KΩ	0Ω	240KΩ	0Ω
V 9	6AU6	†47KΩ	†1000Ω	†.1Ω	†0Ω	#1.2KΩ	#16KΩ	†1000Ω		
V 10	6T8	Inf.	†47KΩ	Inf.	†0Ω	†.1Ω	Inf.	†0Ω	†470KΩ	#330KΩ
V 11	6V6GT	0Ω	†.1Ω	#1000Ω	#60Ω	200KΩ	†3.3KΩ	†0Ω	†0Ω	
V 12	6SN7GT	2.3 Meg.	3 Meg. 1.5 Meg.	0Ω	2.2 Meg.	#3.3KΩ	5.5KΩ 560Ω	.1Ω	0Ω	
V 13	6SN7GT	950KΩ	#75KΩ	300KΩ	250KΩ	#140KΩ	0Ω	.1Ω	0Ω	
V 14	6BG6G	Inf.	0Ω	100Ω	#5KΩ	1 Meg.	1 Meg.	.1Ω	#4.8KΩ	TOP CAP #30KΩ
V 15	5V4G	Inf.	#25KΩ	#300Ω	#300Ω	#25KΩ	#300Ω	#700KΩ	#25KΩ	
V 16	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #25KΩ
V 17	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP Inf.
V 18	5U4G	Inf.	15KΩ	Inf.	79Ω	Inf.	75Ω	Inf.	15KΩ	
V 19	16DP4	.1Ω	240KΩ	PIN 10 #1.2KΩ	PIN 11 25KΩ	PIN 12 0Ω				

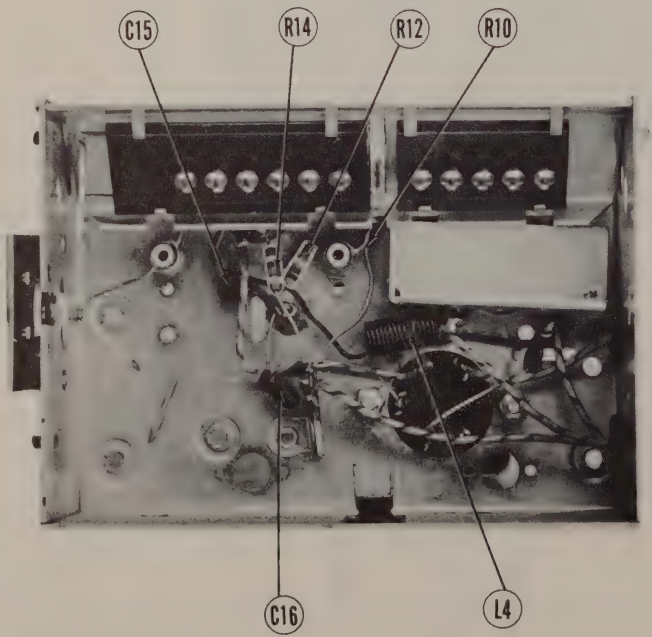
† MEASURED FROM PIN 8 OF V11.
# MEASURED FROM PIN 2 OF V18.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



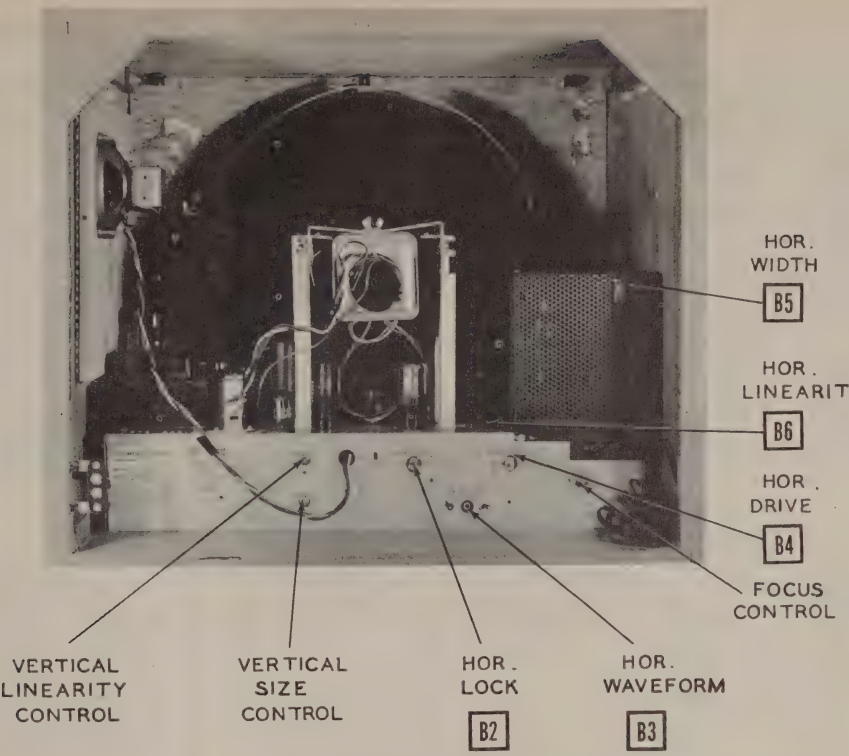
RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION

CHASSIS BOTTOM VIEW–RESISTOR IDENTIFICATION



CABINET-REAR VIEW

HORIZONTAL OSCILLATOR CIRCUIT ADJUSTMENTS

HORIZONTAL FREQUENCY ADJUSTMENT

Turn the set on and tune in a TV station, preferably a test pattern.
Connect a short circuit across terminals C and D of L20.
Turn the horizontal hold control to the extreme clockwise position and adjust the horizontal frequency slug (B1) until the horizontal blanking shows in the picture as a single vertical bar. Remove the short from L20.
Turn the horizontal hold control approximately 1/4 turn counter-clockwise, the picture should sync normally. If the picture does not synchronize properly, proceed with complete horizontal oscillator alignment.

COMPLETE HORIZONTAL OSCILLATOR ALIGNMENT

Connect a short circuit across terminals C and D of L20.
Turn the horizontal hold control to maximum counter-clockwise, the picture should remain in sync.
Momentarily interrupt the signal by switching to another channel and back again.
Slowly turn the horizontal hold control clockwise and carefully note the least number of bars present just before the picture pulls into sync. If more than 9 bars are present, turn the horizontal lock trimmer (B2) 1/2 turn clockwise; if less than 7 are present, turn (B2) 1/2 turn counter-clockwise.
Repeat this procedure until 7 to 9 bars are present just before the picture pulls into sync.
Remove the short from L20 and turn the horizontal hold control if necessary, to synchronize the picture.
Connect a low capacity probe of an oscilloscope to terminal "C" of L20. Adjust the waveform adjustment slug (B3) until the broad and narrow peaks of the pattern are of equal height as shown in figure 6. If necessary during this adjustment turn the horizontal hold control to keep the picture in synchronism.

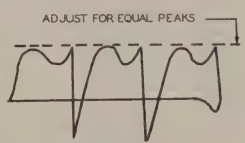


FIG. 6

HORIZONTAL WIDTH AND LINEARITY ADJUSTMENT

Turn the horizontal drive trimmer (B4) clockwise as far as possible without crowding the right half of the picture.
Adjust the width slug (B5) until the picture fills the mask horizontally.
Adjust the horizontal linearity slug (B6) until the picture is symmetrical from left to right.

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.		6AG5	6AG5	7BD
V2	Converter		6J6	6J6	7BF
V3	1st Video IF		6AU6	6AU6	7BK
V4	2nd Video IF		6AU6	6AU6	7BK
V5	3rd Video IF		6AU6	6AU6	7BK
V6	Video Det. -AGC Rectifier		6AL5	6AL5	6BT
V7	Video Amp.		6AC7	6AC7	8N
V8	DC Restorer -Sync. Sep. -Sync. Amp.		12AU7	12AU7	9A
V9	Sound IF Amp.		6AU6	6AU6	7BK
V10	Ratio Det. -AF Amp.		6T8	6T8	9E
V11A	Audio Output		6V6	6V6	7AC
B	Audio Output		6V6GT	6V6GT	7AC
V12	Vert. Osc. -Vert. Amp.		6SN7GT	6SN7GT	8BD
V13	Hor. AFC-Hor. Osc.		6SN7GT	6SN7GT	8BD
V14	Hor. Output		6BG6G	6BG6G	5BT
V15	Damper		5V4G	5V4G	5L
V16	HV Rectifier		1B3GT	1B3GT	3C
V17	HV Rectifier		1B3GT	1B3GT	3C
V18	LV Rectifier		5U4G	5U4G	5T
V19A	Picture Tube		16DP4	16DP4	12D
B	Picture Tube		15AP4	15AP4	12G
C	Picture Tube		15CP4	15CP4	12D

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	80	300		AF16G			Filter
C2	80	300		AF16G			Filter
C3A	40	500		AF88K		TVL-20	◓ Filter
B	40	500					▲ Filter
C4	10Ω Ⓖ						
	30 %	3		PRS6/500			Bias Filter
C5A	50	250		AF10F20B			◓ Filter
B	100	50					▲ Vert. Output Cathode Bypass
C6	40	450		AF8J		TVL-45	Output Plate Decoupling
C7A	10	450		AF2222J		TVL-39	◓ Decoupling
B	10	450					■ Vert. Osc. Decoupling
C	10	450					▲ Vert. Amp. Screen Bypass
D	10	450					Vert. Output Plate Decoupling
C8	2	50		PRS150/4		TVA-12	Stabilizing Cap.
C9	5			CN5DNPO	NPOK-5		Fixed Trimmer
C10	120			GP120M	GP1K-120		RF Decoupling
C11	1000			GP1000M			RF Filament Bypass
C12	100			GP100M	GP1K-100		RF Coupling
C13	20			CN20JNPO	NPOK-20		Osc. Grid Cap.
C14	10			CN10DNPO	NPOK-10		Fixed Trimmer
C15	1000			GP1000M	GP2L-001	29C4	Conv. Filament Bypass
C16	1000			GP1000M	GP2L-001		RF Bypass
C17	5000			BPD-5	811-005	29C1	AGC Filter
C18	5000			BPD-5	811-005	29C1	1st V. IF Decoupling
C19	5000			BPD-5	811-005	29C1	1st V. IF Fil. Bypass
C20	100	500		1468-0001	GP1K-100	1FM-31	IF Coupling
C21	5000			BPD-5	811-005	29C1	AGC Filter
C22	5000			BPD-5	811-005	29C1	2nd V. IF Decoupling
C23	5000			BPD-5	811-005	29C1	2nd V. IF Fil. Bypass
C24	100	500		1468-0001	GP1K-100	1FM-31	IF Coupling
C25	5000			BPD-5	811-005	29C1	3rd V. IF Decoupling
C26	5000			BPD-5	811-005	29C1	3rd V. IF Cath. Bypass
C27	5000			BPD-5	811-005	29C1	3rd V. IF Fil. Bypass
C28	100	500		1468-0001	GP1K-100	1FM-31	IF Coupling
C29	100	500		1468-0001	GP1K-100	1FM-31	IF Coupling
C30	.01	400		P488-01	821-01	TM-11	DAGC Decoupling
C31	.05	200		P288-05		TM-15	AGC Filter
C32	5			GP5K	NPOK-5	MS-55	V. Diode Filter
C33	5000			BPD-5	811-005	29C1	V. DET-AGC Fil. Bypass
C34	5000			BPD-5	811-005	29C1	Bias Filter
C35	.01	400		P488-01	821-01	TM-11	Bias Filter
C36	300	500		1468-0003	GP2K-300	MS-33	V. Amp. Cath. Bypass †
C37	100	500		1468-0001	GP1K-100	1FM-31	V. Amp. Cath. Bypass ‡
C38	.1	600		P688-1		TM-1	Video Coupling
C39	.1	600		P688-1		TM-1	Pic. Tube Cath. Decoupling
C40	22			GP22M	GP1K-22	MS-425	Sync. Sep. Plate Bypass
C41	39			GP39M	GP1K-39	1FM-44	S. IF Coupling
C42	.02	600		P688-02		TM-12	RF Bypass
C43	5000			BPD-5	811-005	29C1	S. IF Screen Bypass
C44	.022	600		P688-022		TM-12	S. IF Decoupling
C45	.001	400		P688-001	GP2L-001	TM-21	Diode Load Cap.
C46	3900	500		1467-004		1FM-24	De-emphasis
C47	.05	200		P288-05		TM-15	Audio Coupling
C48	5000			BPD-5	811-005	29C1	Audio Coupling
C49	.02	600		P688-02		TM-12	Audio Coupling
C50	.05	200		P288-05		TM-15	Bias Filter
C51	.005	600		P688-005	811-005	TM-25	Output Plate Bypass
C52	.01	200		P488-01	821-01	TM-11	Sync. Coupling
C53	.002	400		P688-002	GP2M-002	TM-22	Integrator Net.
C54	.005	400		P688-005	811-005	TM-25	Integrator Net.
C55	.005	400		P688-005	811-005	TM-25	Integrator Net.
C56	4700	500		1467-005	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C57	.1	600		P688-1		TM-1	Vert. Discharge
C58	.25	400		P488-25		TC-2	Vert. Sweep Coupling

CAPA

ITEM No.	RATING: CAP.	RATING: VOLT	REPLAC: VIDEOLA PART No.	REPLAC: AEROVOX PART No.
C59	180	500		1468-0002
C60	.0022	600		P688-0022
C61	5	1500		
C62	.022	600		P688-022
C63	.22	400		P488-22
C64	.047	600		P688-047
C65	180	500		1468-0002
C66	.01	600		P688-01
C67	.0022	600		P688-0022
C68	580	500		1468-0005
C69	.047	1000		P1088-047
C70	330	500		1468-00035
C71	.22	400		P488-22
C72	.033	1000		P1088-033
C73	.047	1000		P1088-047
C74	.25	200		P488-25
C75	300	500		1469-0003
C76	500	10000		
C77	500	10000		
C78	500	10000		
C79	.01	400		P488-01
C80	.01	400		P488-01
C81	.01	400		P488-01
C82	.001	400		P688-001
C83	.01	600		P688-01

* Not used in all models.
† Some models use 680MMF in this application.
‡ Some models use 470MMF in this application.

ITEM No.	RATING: RESIST-ANCE	RATING: WATTS	REPLACEMENT D: VIDEOLA PART No.	REPLACEMENT D: IRC PART No.
R1A	1 Meg.			B11-137 *
B	50KΩ			B11-123 *
C	Shaft End			E187 *
R2A	250KΩ			Q13-130
B	Switch			76-1
R3A	750Ω			
B	100KΩ			
R4	5000Ω			Q11-114
R5	3.2Meg.			Q11-239
R6	175Ω	4		

* Additional parts to be used with "Concentrikit"
Note 1. Late productions models use 10KΩ, 4 w

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT D: VIDEOLA PART No.	PA
R7	3900Ω 10%			BTS
R8	47KΩ 10%			BTS
R9	10KΩ 10%			BTS
R10	2200Ω			BTS
R11	4700Ω 10%			BTS
R13	220KΩ			
R13	10KΩ 10%			BTS
R14	4700Ω 10%			BTS
R15	1 Meg.			BTS
R16	1 Meg.			BTS
R17	4700Ω			BTS
R18	82Ω 10%			
R19	100Ω			
R20	330Ω			
R21	8200Ω 10%			
R22	82Ω 10%			
R23	100Ω			
R24	8200Ω 10%			
R25	82Ω 10%			
R26	100Ω			
R27	2.2 Meg.			BTS
R28	680KΩ			BTS
R29	39KΩ 10%	1		BTA
R30	10000Ω			BTS
R31	8200Ω 10%			BTS
R32	120Ω 10%			
R33	51KΩ 10%	2		
R34	56KΩ 10%	2		BT-
R35	43KΩ 5%	2		
R36	43KΩ 5%	2		
R37	22KΩ	1		BTA
R38	5600Ω 10%	1		BTA
R39	2200Ω			BTS
R40	240KΩ 5%			
R41	47KΩ			BTS
R42	820KΩ 10%			BTS
R43	1 Meg.			BTS
R44	3300Ω 10%	1		BTA
R45	47KΩ			
R46	1000Ω			BTS
R47	33KΩ 10%	1		BTA
R48	22KΩ	2		
R49	1000Ω			BTS
R50	1000Ω			BTS
R51	47KΩ			BTS
R52	15KΩ			BTS

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6AG5	6AG5	7BD	
V2	Converter	6J8	6AU8	7BJ	
V3	1st Video IF	6AU8	6AU8	7BK	
V4	2nd Video IF	6AU8	6AU8	7BK	
V5	3rd Video IF	6AU8	6AU8	7BK	
V6	Video Det.-AGC Rectifier	6AL5	6AL5	6BT	
V7	Video Amp.	6AC7	6AC7	8N	
V8	DC Restorer-Sync. Sep.-Sync. Amp.	12AU7	12AU7	9A	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Det.-AF Amp.	6T8	6T8	9E	
V11A	Audio Output	6V6	6V6	7AC	
B	Audio Output	6V6GT	6V6GT	7AC	
V12	Vert. Osc.-Vert. Amp.	6SN7GT	6SN7GT	8BD	
V13	Hor. AFC-Hor. Osc.	6SN7GT	6SN7GT	8BD	
V14	Hor. Output	6BG6G	6BG6G	5BT	
V15	Damper	5V4G	5U4G	5L	
V16	HV Rectifier	1B3GT	1B3GT	3C	
V17	HV Rectifier	1B3GT	1B3GT	3C	
V18	LV Rectifier	5U4G	5U4G	5T	
V19A	Picture Tube	16DP4	16DP4	12D	
B	Picture Tube	15AP4	15AP4	12G	
C	Picture Tube	15CP4	15CP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	80	300		AF16G			Filter
C2	80	300		AF16G			Filter
C3A	40	500		AF98K			▲ Filter
B	40	500				TVL-20	▲ Filter
C4	100 Ω						
	30 %	3		PRS6/500			Bias Filter
C5A	50	250		AF10P20B			▲ Filter
B	100	50					▲ Vert. Output Cathode Bypass
C6	40	450		AF8J		TVL-45	Output Plate Decoupling
C7A	10	450		AF2222J		TVL-39	▲ Decoupling
B	10	450					■ Vert. Osc. Decoupling
C	10	450					▲ Vert. Amp. Screen Bypass
D	10	450					Vert. Output Plate Decoupling
C8	2	50		PRS150/4		TVA-12	Stabilizing Cap.
C9	5			CN5DNPO	NPOK-5		Fixed Trimmer
C10	120			GP120M	GPIK-120		RF Decoupling
C11	1000			GP1000M			RF Filament Bypass
C12	100			GP100M	GPIK-100		RF Coupling
C13	20			CN20JNPO	NPOK-20		Osc. Grid Cap.
C14	10			CN10DNPO	NPOK-10		Fixed Trimmer
C15	1000			GP1000M	GP2L-001	29C4	Conv. Filament Bypass
C16	1000			GP1000M	GP2L-001		RF Bypass
C17	5000			BPD-5	81L-005	29C1	AGC Filter
C18	5000			BPD-5	81L-005	29C1	1st V. IF Decoupling
C19	5000			BPD-5	81L-005	29C1	1st V. IF Fil. Bypass
C20	100	500		1468-0001	GPIK-100	1FM-31	IF Coupling
C21	5000			BPD-5	81L-005	29C1	AGC Filter
C22	5000			BPD-5	81L-005	29C1	2nd V. IF Decoupling
C23	5000			BPD-5	81L-005	29C1	2nd V. IF Fil. Bypass
C24	100	500		1468-0001	GPIK-100	1FM-31	IF Coupling
C25	5000			BPD-5	81L-005	29C1	3rd V. IF Decoupling
C26	5000			BPD-5	81L-005	29C1	3rd V. IF Cath. Bypass
C27	5000			BPD-5	81L-005	29C1	3rd V. IF Fil. Bypass
C28	100	500		1468-0001	GPIK-100	1FM-31	IF Coupling
C29	100	500		1468-0001	GPIK-100	1FM-31	IF Coupling
C30	.01	400		P468-01	821-01	TM-11	DAGC Decoupling
C31	.05	200		P286-05		TM-15	AGC Filter
C32	5			GP5K	NPOK-5	MS-55	V. Diode Filter
C33	5000			BPD-5	81L-005	29C1	V. DET-AGC Fil. Bypass
C34	5000			BPD-5	81L-005	29C1	Bias Filter
C35	.01	400		P468-01	821-01	TM-11	Bias Filter
C36	300	500		1468-0003	GP2K-300	MS-33	V. Amp. Cath. Bypass †
C37	300	500		1468-0001	GPIK-100	1FM-31	V. Amp. Cath. Bypass †
C38	.1	600		P688-1		TM-1	Video Coupling
C39	.1	600		P688-1		TM-1	Pic. Tube Cath. Decoupling
C40	22			GP22M	GPIK-22	MS-425	Sync. Sep. Plate Bypass
C41	39			GP39M	GPIK-39	1FM-44	S. IF Coupling
C42	.02	600		P688-02		TM-12	RF Bypass
C43	5000			BPD-5	81L-005	29C1	S. IF Screen Bypass
C44	.022	600		P688-022		TM-12	S. IF Decoupling
C45	.001	400		P688-001	GP2L-001	TM-21	Diode Load Cap.
C46	3900	500		1467-004		1FM-24	De-emphasis
C47	.05	200		P286-05		TM-15	Audio Coupling
C48	5000			BPD-5	81L-005	29C1	Audio Coupling
C49	.02	600		P688-02		TM-12	Audio Coupling
C50	.05	200		P286-05		TM-15	Bias Filter
C51	.005	600		P688-005	81L-005	TM-25	Output Plate Bypass
C52	.01	200		P486-01	821-01	TM-11	Sync. Coupling
C53	.002	400		P688-002	GP2M-002	TM-22	Integrator Net.
C54	.005	400		P688-005	81L-005	TM-25	Integrator Net.
C55	.005	400		P688-005	81L-005	TM-25	Integrator Net.
C56	4700	500		1467-005	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C57	.1	600		P688-1		TM-1	Vert. Discharge
C58	.25	400		P488-25		TC-2	Vert. Sweep Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C59	180	500		1468-0002	GP2K-180	1FM-32	Hor. Sync. Coupling
C60	.0022	600		P688-0022	GP2M-0022	TM-22	Hor. Sync. Coupling
C61	5	1500					Hor. Feedback
C62	.022	600		P688-022		TM-12	AFC Filter
C63	.22	400		P488-22		TC-2	AFC Filter
C64	.047	600		P688-047		TM-15	AFC Plate Bypass
C65	180	500		1468-0002	GP2K-180	1FM-32	Hor. Osc. Grid Cap.
C66	.01	600		P688-01		TM-11	Fixed Trimmer
C67	.0022	600		P688-0022	GP2M-0022	TM-22	Hor. Discharge
C68	580	500		1468-0005	GP2K-560	MS-36	Hor. Sweep Coupling
C69	.047	1000		P1088-047		TR-15	Hor. Output Screen Bypass
C70	330	500		1468-00035	GP2K-330	1FM-1-X35	Hor. Output Screen Bypass
C71	.22	400		P488-22		TC-2	Hor. Output Cath. Bypass
C72	.033	1000		P1088-033			Damper Filter
C73	.047	1000		P1088-047		TR-15	Damper Filter
C74	.25	200		P488-25		TC-2	Hor. Sweep Coupling
C75	300	500		1469-0003	GP2K-300	MS-33	Fixed Trimmer *
C76	500	10000			410-500		Voltage Doubler Cap. *
C77	500	10000			410-500		HV Filter
C78	500	10000			410-500		HV Filter *
C79	.01	400		P488-01	821-01	TM-11	Line Filter
C80	.01	400		P488-01	821-01	TM-11	Line Filter
C81	.01	400		P488-01	821-01	TM-11	Vert. Discharge *
C82	.001	400		P688-001	GP2L-001	TM-21	Diode Load Cap. *
C83	.01	600		P688-01	821-01	TM-11	Acc. Anode Bypass *

* Not used in all models.
† Some models use 680MMF in this application.
† Some models use 470MMF in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.			B11-137 *		Vert. hold control, panel
B	50KΩ			B11-123 *	970111-8	Horiz. hold control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
R2A	250KΩ			Q13-130	M-64-Z	Volume control
B	Switch			T6-1	SW-A	Attach to R2A per instructions
R3A	750Ω					Contrast control, tapped at 500Ω
B	100KΩ					Brightness control
R4	5000Ω			Q11-114	M-19-S	Vert. linearity control
R5	3.2Meg.			Q11-239		Vert. size control
R6	175Ω	4				Focus control, Wire Wound-See Note 1

* Additional parts to be used with "Concentrikit".
Note 1. Late productions models use 10KΩ, 4 watt, Wire Wound control in this application.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES: ALL RESISTORS ARE ± 20% UNLESS OTHERWISE STATED.
R7	3900Ω 10%			BTS-3900	RF Grid
R8	47KΩ 10%			BTS-47K	AGC Network
R9	10KΩ 10%			BTS-10K	RF Plate Coil Shunt
R10	2200Ω			BTS-2200	RF Decoupling
R11	4700Ω 10%			BTS-4700	Conv. Grid
R12	220KΩ				Conv. Grid
R13	10KΩ 10%			BTS-10K	Osc. Grid
R14	4700Ω 10%			BTS-4700	Osc. Plate
R15	1 Meg.			BTS-1 Meg.	AGC Network
R16	1 Meg.			BTS-1 Meg.	AGC Network
R17	4700Ω			BTS-4700	1st Video IF Grid-See Note 2
R18	82Ω 10%				1st Video IF Cathode
R19	100Ω			BTS-39K	1st Video IF Decoupling
R20	330Ω			BTS-1000	AGC Network
R21	8200Ω 10%			BTS-8200	2nd Video IF Grid
R22	82Ω 10%				2nd Video IF Cathode
R23	100Ω				2nd Video IF Decoupling
R24	8200Ω 10%				3rd Video IF Grid Coil Shunt-See Note 2
R25	82Ω 10%				3rd Video IF Cathode
R26	100Ω				3rd Video IF Decoupling
R27	2.2 Meg.			BTS-2.2 Meg.	AGC Network
R28	680KΩ			BTS-680K	AGC Rect. Diode Load
R29	39KΩ 10%			BTA-39K	Voltage Divider
R30	1000Ω			BTS-1000	Bias Network
R31	8200Ω 10%			BTS-8200	Video Det. Diode Load
R32	120Ω 10%				Parasitic Supp.
R33	56KΩ 10%	2			Video Amp. Plate
R34	56KΩ 10%	2		BT-2-56K	Video Amp. Plate
R35	43KΩ 5%	2			Video Amp. Screen
R36	43KΩ 5%	2			Video Amp. Screen
R37	22KΩ	1		BTA-22K	Voltage Divider
R38	5600Ω 10%	1		BTA-560	Voltage Divider
R39	2200Ω			BTS-2200	Picture Tube Grid
R40	240KΩ 5%				DC Rest. Load
R41	47KΩ			BTS-47K	DC Rest. Load
R42	820KΩ 10%			BTS-820K	Voltage Divider
R43	1 Meg.			BTS-1 Meg.	Sync. Amp. Grid
R44	3300Ω 10%			BTA-3300	Sync. Amp. Plate
R45	47KΩ				Sound IF Grid
R46	1000Ω			BTS-1000	Sound IF Cathode
R47	33KΩ 10%	1		BTA-33K	Voltage Divider-See Note 13
R48	22KΩ	2			Sound IF Screen-See Note 12
R49	1000Ω			BTS-1000	Sound IF Decoupling
R50	1000Ω			BTS-1000	Decoupling
R51	47KΩ			BTS-47K	Ratio Det. Diode Load
R52	15KΩ			BTS-15K	De-emphasis

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R53	470KΩ			BTS-470K	AF Grid-See Note 11
R54	470KΩ			BTS-470K	Voltage Divider-See Note 4
R55	3300Ω			BTS-3300	Voltage Divider
R56	330KΩ			BTS-330K	AF Plate-See Note 10
R57	100KΩ			BTS-100K	Output Grid
R58	300KΩ 5%				Voltage Divider
R59	160KΩ 5%				Voltage Divider
R60	390Ω 10%	2		BW-2-390	Filter
R61	27KΩ 10%			BTS-27K	Voltage Divider
R62	240KΩ 5%				Voltage Divider
R63	1000Ω			BTS-1000	Acc. Anode Decoupling-See Note 9
R64	22KΩ 5%			BTS-22K-5%	Integrator
R65	8200Ω 10%			BTS-8200	Integrator
R66	8200Ω 10%			BTS-8200	Integrator
R67	1.2 Meg.10%			BTS-1.2 Meg.	Vert. Osc. Grid
R68	6.8 Meg.			BTS-6.8 Meg.	Voltage Divider
R69	100KΩ			BTS-100K	Voltage Divider
R70	1.5 Meg.			BTS-1.5 Meg.	Vert. Osc. Plate
R71	2.2 Meg.			BTS-2.2 Meg.	Vert. Amp. Grid
R72	560Ω 10%			BTS-560	Vert. Amp. Cathode
R73	3300Ω			BTS-3300	Vert. Peaking
R74	3300Ω			BTS-3300	Vert. Amp. Decoupling
R75	820KΩ 5%			BTS-820K-5%	Horiz. AFC Grid
R76	150KΩ 10%			BTS-150K	Horiz. AFC Cathode
R77	150KΩ 5%			BTA-150K-5%	Horiz. AFC Cathode
R78	8200Ω 10%			BTS-8200	Horiz. AFC Filter Network
R79	2.7 Meg. 5%	1		BTA-2.7 Meg. 5%	Voltage Divider
R80	68KΩ 10%			BTS-68K	Voltage Divider
R81	120KΩ 10%			BTA-120K	Voltage Divider
R82	150KΩ 10%			BTS-150K	Horiz. AFC Filter Network
R83	100KΩ 5%			BTA-150K	Horiz. Osc. Grid
R84	8200Ω 10%			BTS-8200	Horiz. Osc. Transformer Shunt
R85	22KΩ 5%			BTS-22K-5%	Horiz. Osc. Transformer Shunt
R86	100KΩ 10%			BTA-100K	Horiz. Osc. Plate
R87	56KΩ 10%			BTS-56K	Filter
R88	10KΩ 10%			BTS-10K	Filter
R89	68Ω 10%				Parasitic Supp.
R90	1 Meg.			BTS-1 Meg.	Horiz. Output Grid
R91	100Ω 5%	2		BW-2-100	Horiz. Output Cathode
R92	4700Ω	2		BT-2-4700	Horiz. Output Screen-See Note 8
R93	30KΩ 10%	50		EP-30, 000	Damper Filter-Wire Wound
R94	4.7Ω	1			HV Rect. Filament -See Note 4
R95	4.7Ω	1			HV Rect. Filament -See Note 4
R96	180KΩ 10%	2			HV Rect. Load-See Note 6 and 4
R97	180KΩ 10%	2			HV Rect. Load-See Note 6 and 4
R98	180KΩ 10%	2			HV Rect. Load-See Note 6 and 4
R99	560KΩ 10%			BTS-150K	Feedback
R100	680KΩ				HV Filter
R101	12Ω 10%			BW-½-12	Bias Network
R102	150Ω 10%	10		AB-150	Filter-Wire Wound-See Note 3
R103	1000Ω 10%	10		AB-1000	Focus Coil Shunt-Wire Wound-See Notes 4 and 14
R104	220Ω	2		BW-2-220	Focus Coil Shunt
R105	22KΩ	2		BT-2-22K	Bleeder-See Note 5
R106	22KΩ	2		BT-2-22K	Bleeder-See Note 5
R107	3300Ω 10%	10			Series Focus Coil-Wire Wound-See Note 3
R108	68Ω				Balancing-See Note 7
R109	47Ω			BW-½-47	Feedback-See Note 7
R110	6000Ω	20		DG-6000	Voltage Divider-See Note 7
R111	10Ω			BW-½-10	AF Cathode-See Note 7

Note 2. Some models use 5600Ω resistor in this application.
Note 3. Used in late production models only.
Note 4. Not usedin all models.
Note 5. Some models use 27KΩ, 2 watt resistor in this application.
Note 6. In some models item R96, R97 and R98 may be replaced by one 2 Meg., 4 watt resistor.
Note 7. Used only in late models.
Note 8. Late models use 27KΩ, 2 watt resistor in this application.
Note 9. Late models use 100KΩ resistor in this application.
Note 10. Late models use 150KΩ, 1 watt resistor in this application.
Note 11. Late models use 4.7 Meg. resistor in this application.
Note 12. Late models use 100KΩ resistor in this application.
Note 13. Late models use 27KΩ resistor in this application.
Note 14. Late models use 1200Ω resistor in this application.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	65Ω	3.3Ω			46E6S8	
	CONE DIA.	V. C. DIA.				
SP2	3 7/8" x 5 7/8"	9/16"				

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC	850VCT	5VAC	5VAC			P-3067	TP-383
	@ 1.98A	230ADC @ 350MA	@ 3A	⑤ 2A				
		SEC. 4	SEC. 5					
		6.3VAC @ 8A	6.3VAC @ 1.2A					

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	DC RESISTANCE		VIDEOLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.					
T2	158Ω	1280Ω		A-8121	A-4000	TBO-1	Vert. Block Osc. Trans.
T3A	100Ω Tap	SEC. 1		A-8119	HVO5	TFB-4	Hor. Output Trans.
	⑤ 22Ω	10.6Ω Tap					
		⑤ .6Ω					
		SEC. 2					
		0Ω					
		SEC. 3					
		0Ω					
B			⑤				Hor. Output Trans.
T4	570Ω	7.2Ω		A-8116	A-3035	TSO-4	Vert. Output Trans.
T5A	13.5Ω			DY-1	MD1		Hor. Deflection Coil
B	60Ω						Vert. Deflection Coil
T6	275Ω			FC-10	MF1		Focus Coil

⑤ Hor. output transformer of the GE type used in some models.

TRANSFORMER (AUDIO OUTPUT)

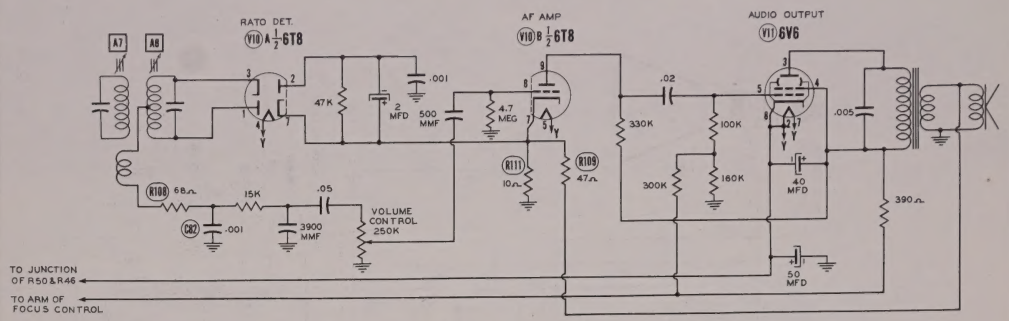
ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		VIDEOLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T7	5.4KΩ	3.3Ω	390Ω	.2Ω		A-3877	A-2930	RO-9 ①	① Drill one new mounting hole.

COILS (RF-IF)

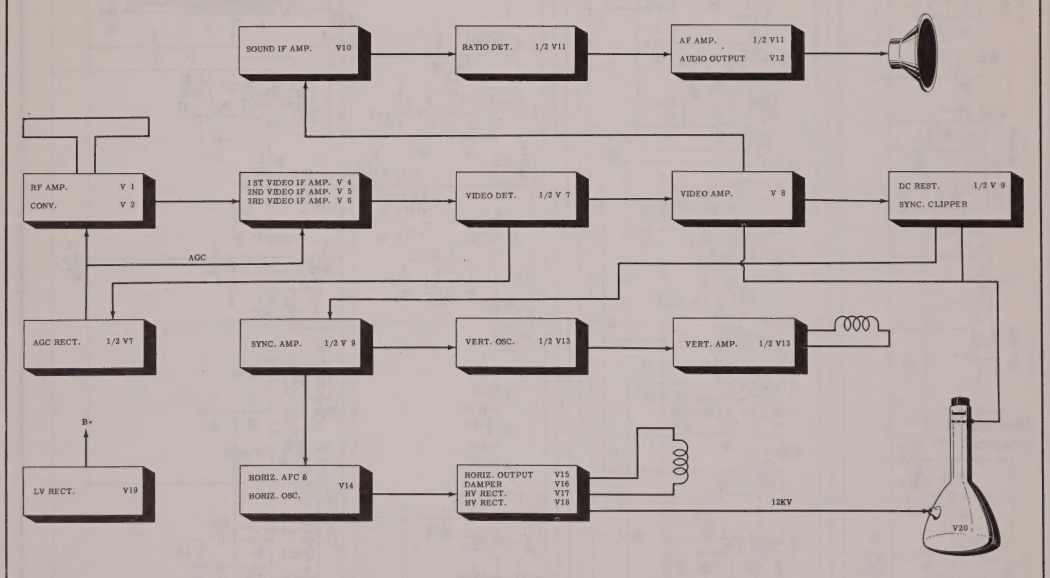
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	VIDEOLA PART No.	MEISSNER PART No.	
L1	Ant. Coils	0Ω				Part of tuner.
L2	RF, Mixer & Osc. Coils	0Ω				Part of tuner.
L3	Fil. Choke	0Ω				Part of tuner.
L4	Fil. Choke	0Ω				Part of tuner.
L5	1st Video IF	.2Ω	.2Ω			Part of tuner.
L6	Fil. Choke	0Ω				
L7	2nd Video IF	.2Ω				
L8	Fil. Choke	0Ω				
L9	Plate Choke	2.2Ω				
L10	3rd Video IF	.2Ω				
L11	Fil. Choke	0Ω				
L12	Plate Choke	2.2Ω				
L13	4th Video IF	.2Ω				
L14	Peaking	5Ω				
L15	Peaking	12Ω				
L16	Peaking	8Ω				Wound on 18KΩ resistor.
L17	Peaking	10Ω				
L18	Sound IF	1.8Ω	1.8Ω			
L19	Ratio Det. Trans.	4Ω	2Ω			
L20	Hor. Osc. Trans.	130Ω	36Ω			
L21	Width Cont.	.1Ω				
L22	Hor. Linearity	36Ω				
L23	Fil. Choke	0Ω				

MISCELLANEOUS

ITEM No.	PART NAME	VIDEOLA PART No.	NOTES
M1	RF Tuner		Standard Coil
M2	Fuse		Type AGC, .25A
M3	Fuse		5A., 250V
M4	Ion Trap		Permanent Magnet Type
	Trimmer		Horiz. Locking Range (25-280MMF)
	Trimmer		Horiz. Drive (25-280MMF)



ALTERNATE AUDIO CIRCUIT



BLOCK DIAGRAM